US012293388B1

(12) **United States Patent**
Prevec

(10) **Patent No.: US 12,293,388 B1**
(45) **Date of Patent: May 6, 2025**

(54) **SHOPPER ASSISTANCE SYSTEM BASED UPON SHOPPER DWELL TIME AND RELATED METHODS**

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(73) Assignee: **INMAR CLEARING, INC.**, Winston-Salem, NC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **18/542,666**

(22) Filed: **Dec. 16, 2023**

(51) **Int. Cl.**
G06Q 30/0251 (2023.01)

(52) **U.S. Cl.**
CPC ***G06Q 30/0261*** (2013.01); ***G06Q 30/0255*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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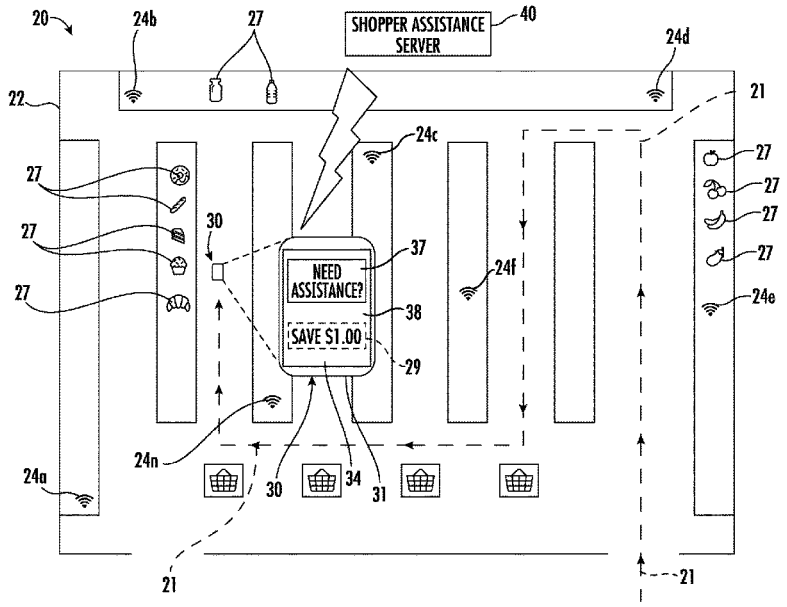
(57) **ABSTRACT**

A shopper assistance system may include a mobile device associated with a shopper, and a shopper assistance server. The server may, as the shopper moves along a path of travel within a physical store, cooperate with the mobile device to obtain geographic position data associated with a shopper position within the physical store, and determine a shopper dwell time at a given shopper position within the physical store based upon the geographic position data. The server may also determine a product for purchase adjacent the shopper based upon the given shopper position and cooperate with the mobile device to provide a user interface for providing shopper assistance with the product for purchase based upon the shopper dwell time. The server may also generate and communicate to the mobile device a digital promotion based upon the shopper dwell time.

29 Claims, 17 Drawing Sheets



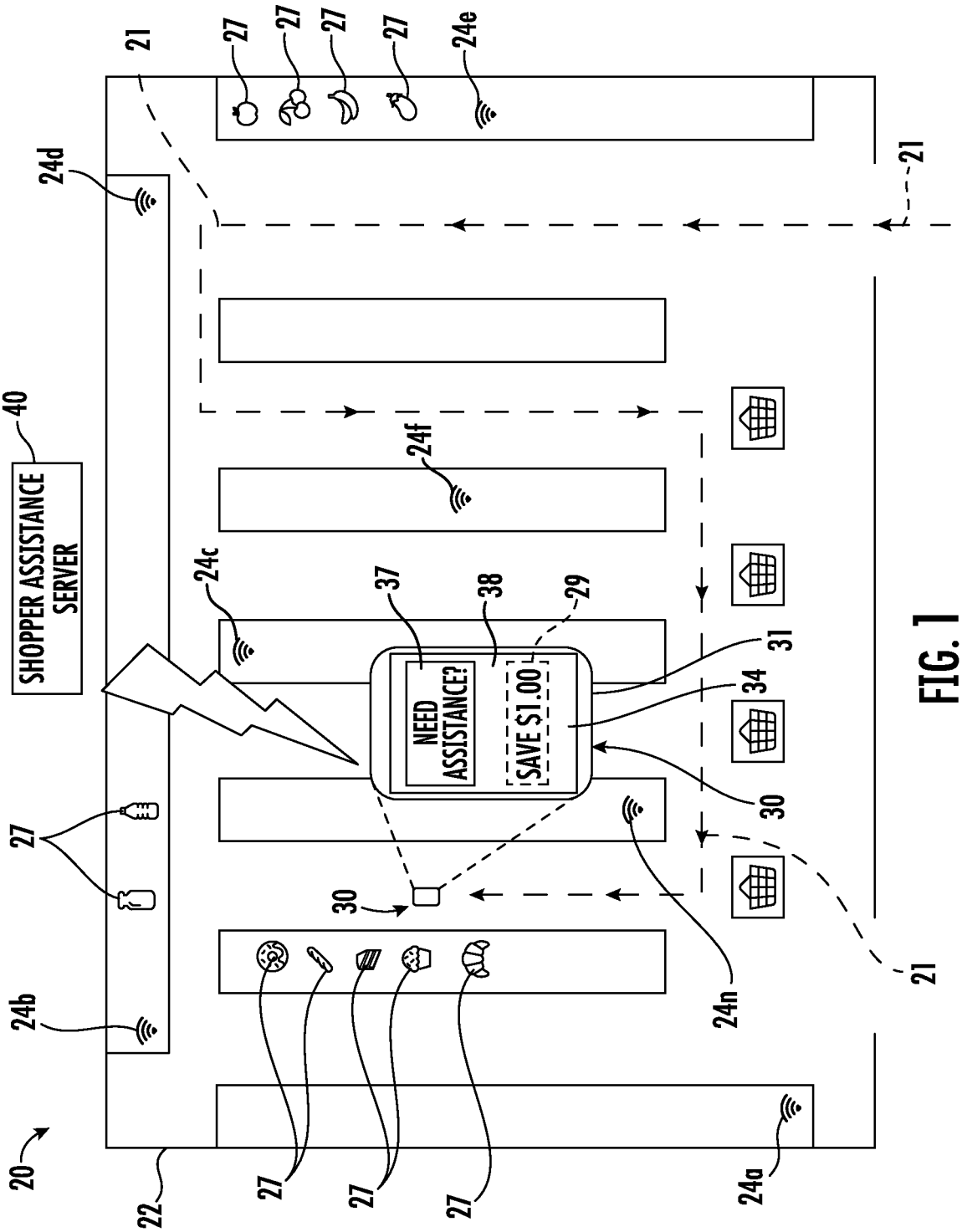

SHOPPER ASSISTANCE SERVER
40
NEED ASSISTANCE?
SAVE $1.00
20
21
22
24a
24b
24c
24d
24e
24f
24n
27
29
30
31
34
37
38

FIG. 1

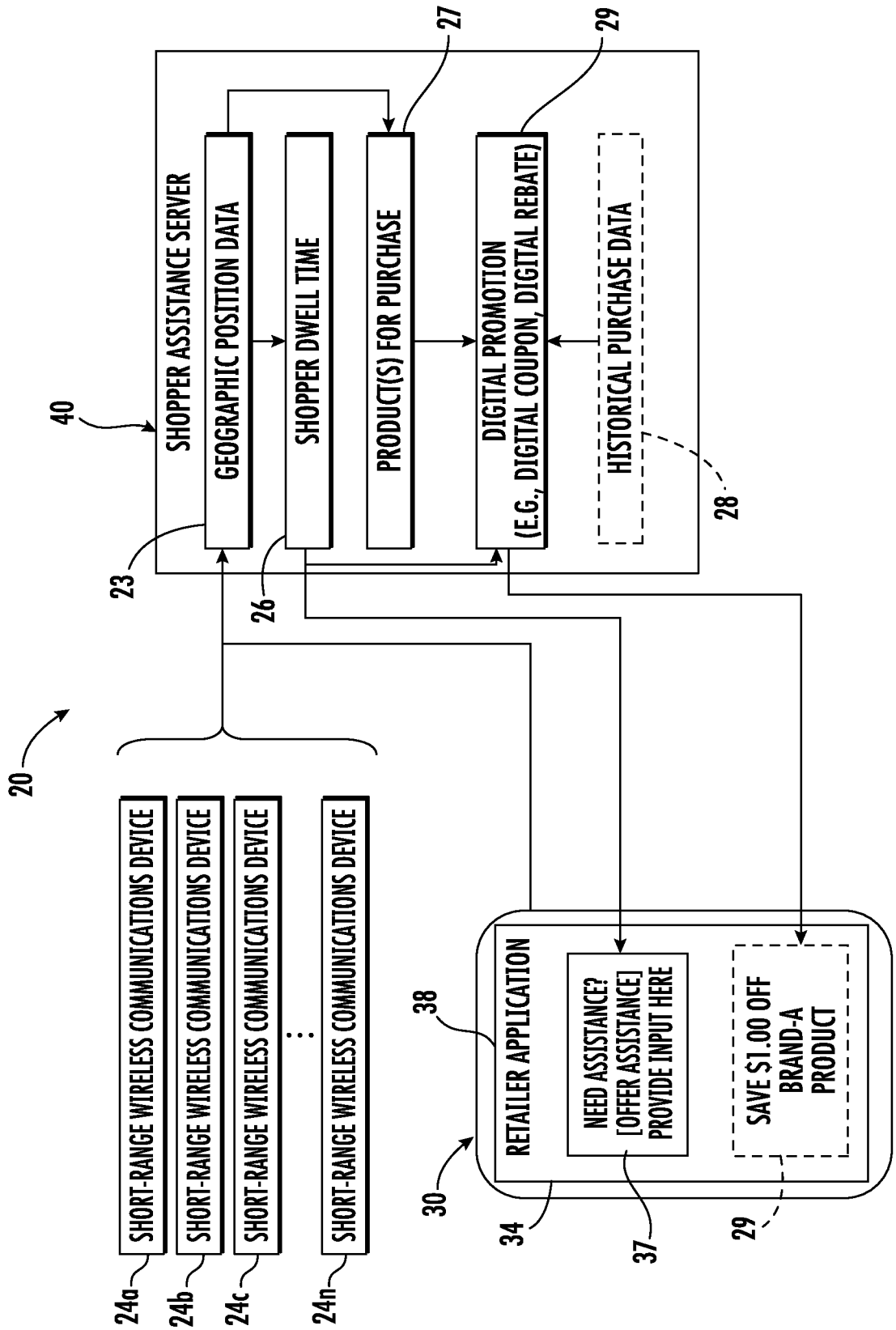

20
40
SHOPPER ASSISTANCE SERVER
GEOGRAPHIC POSITION DATA
SHOPPER DWELL TIME
PRODUCT(S) FOR PURCHASE
DIGITAL PROMOTION (E.G., DIGITAL COUPON, DIGITAL REBATE)
HISTORICAL PURCHASE DATA
23
26
27
28
29
SHORT-RANGE WIRELESS COMMUNICATIONS DEVICE
SHORT-RANGE WIRELESS COMMUNICATIONS DEVICE
SHORT-RANGE WIRELESS COMMUNICATIONS DEVICE
SHORT-RANGE WIRELESS COMMUNICATIONS DEVICE
24a
24b
24c
24n
RETAILER APPLICATION
NEED ASSISTANCE? [OFFER ASSISTANCE] PROVIDE INPUT HERE
SAVE $1.00 OFF BRAND-A PRODUCT
30
34
37
38

FIG. 2

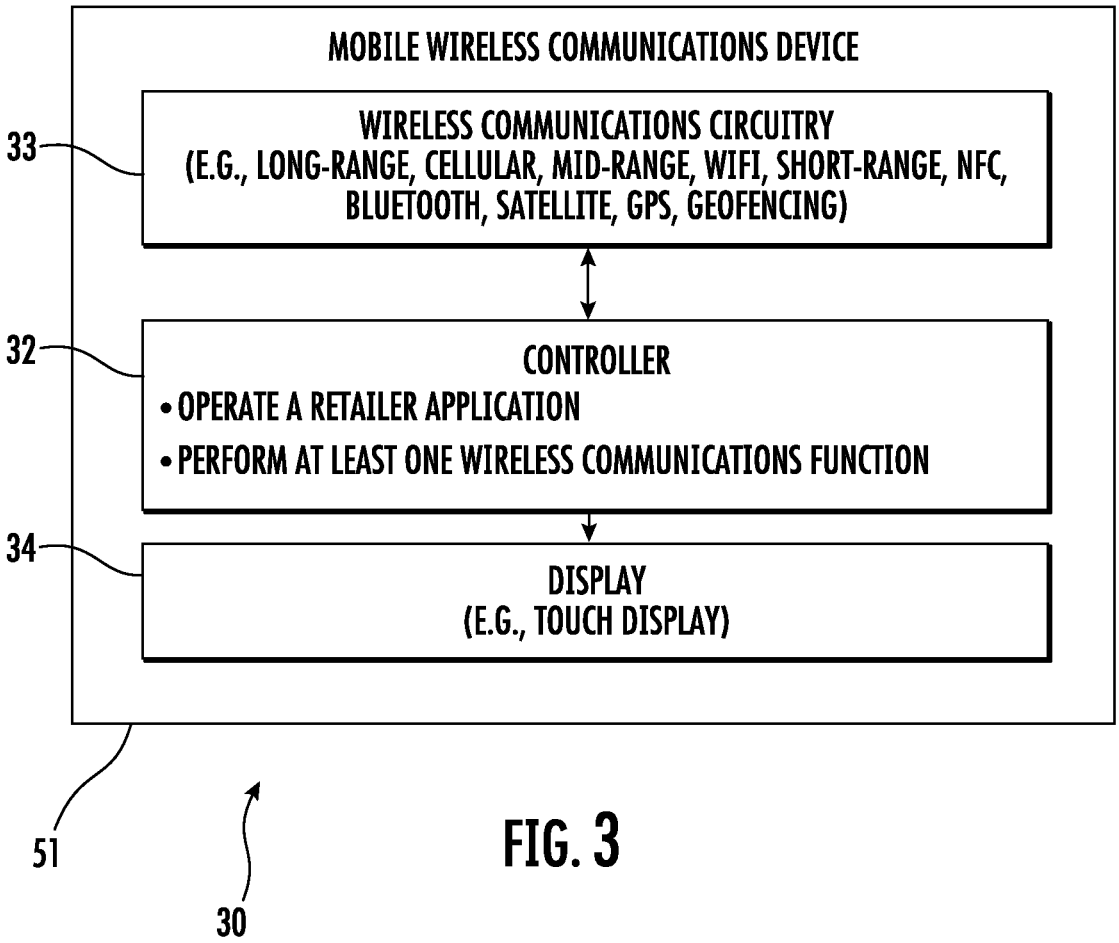

MOBILE WIRELESS COMMUNICATIONS DEVICE
33
WIRELESS COMMUNICATIONS CIRCUITRY
(E.G., LONG-RANGE, CELLULAR, MID-RANGE, WIFI, SHORT-RANGE, NFC, BLUETOOTH, SATELLITE, GPS, GEOFENCING)
32
CONTROLLER
• OPERATE A RETAILER APPLICATION
• PERFORM AT LEAST ONE WIRELESS COMMUNICATIONS FUNCTION
34
DISPLAY
(E.G., TOUCH DISPLAY)
51
30

FIG. 3

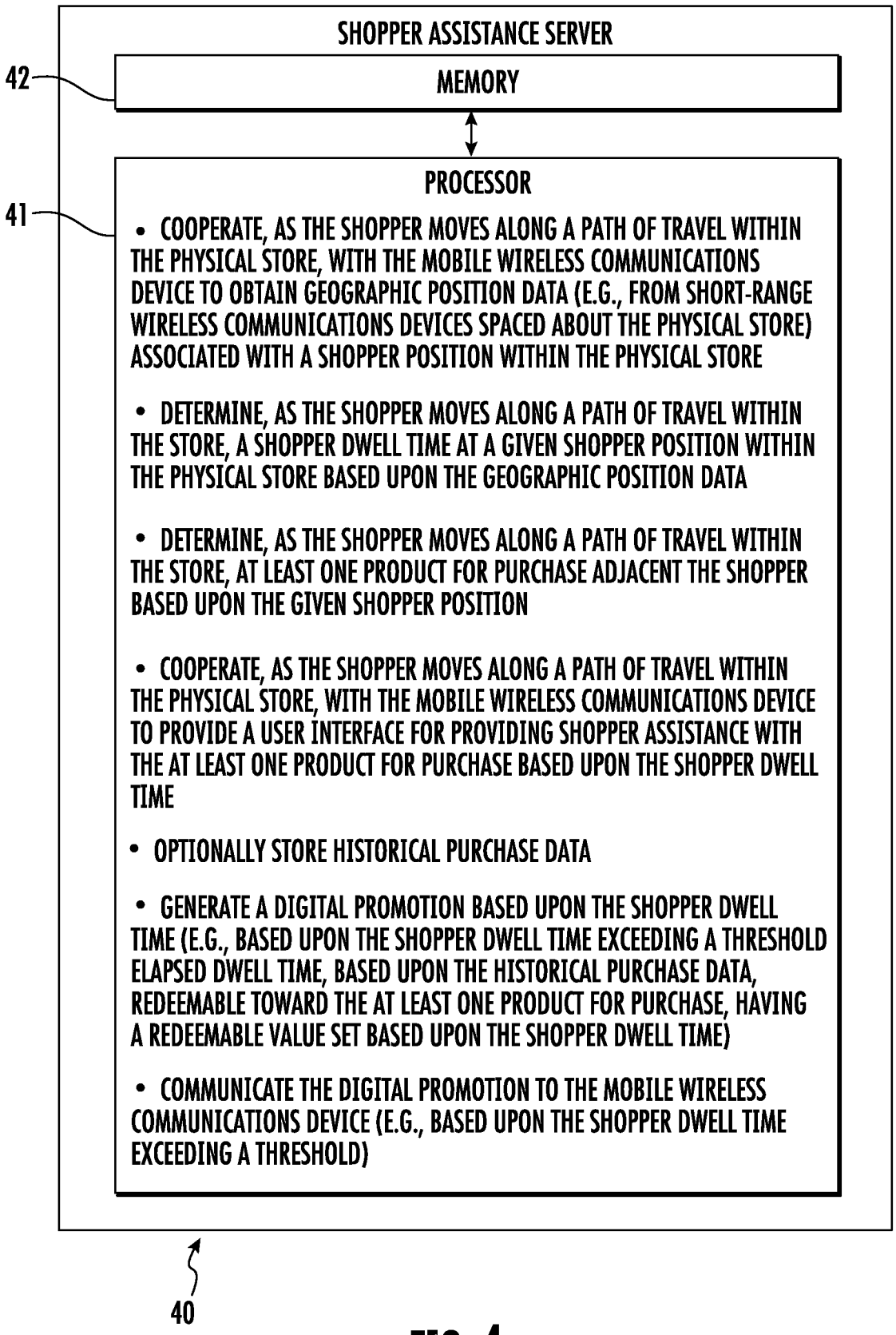

SHOPPER ASSISTANCE SERVER
42
MEMORY
PROCESSOR
41
• COOPERATE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, WITH THE MOBILE WIRELESS COMMUNICATIONS DEVICE TO OBTAIN GEOGRAPHIC POSITION DATA (E.G., FROM SHORT-RANGE WIRELESS COMMUNICATIONS DEVICES SPACED ABOUT THE PHYSICAL STORE) ASSOCIATED WITH A SHOPPER POSITION WITHIN THE PHYSICAL STORE
• DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE STORE, A SHOPPER DWELL TIME AT A GIVEN SHOPPER POSITION WITHIN THE PHYSICAL STORE BASED UPON THE GEOGRAPHIC POSITION DATA
• DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE STORE, AT LEAST ONE PRODUCT FOR PURCHASE ADJACENT THE SHOPPER BASED UPON THE GIVEN SHOPPER POSITION
• COOPERATE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, WITH THE MOBILE WIRELESS COMMUNICATIONS DEVICE TO PROVIDE A USER INTERFACE FOR PROVIDING SHOPPER ASSISTANCE WITH THE AT LEAST ONE PRODUCT FOR PURCHASE BASED UPON THE SHOPPER DWELL TIME
• OPTIONALLY STORE HISTORICAL PURCHASE DATA
• GENERATE A DIGITAL PROMOTION BASED UPON THE SHOPPER DWELL TIME (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD ELAPSED DWELL TIME, BASED UPON THE HISTORICAL PURCHASE DATA, REDEEMABLE TOWARD THE AT LEAST ONE PRODUCT FOR PURCHASE, HAVING A REDEEMABLE VALUE SET BASED UPON THE SHOPPER DWELL TIME)
• COMMUNICATE THE DIGITAL PROMOTION TO THE MOBILE WIRELESS COMMUNICATIONS DEVICE (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD)
40

FIG. 4

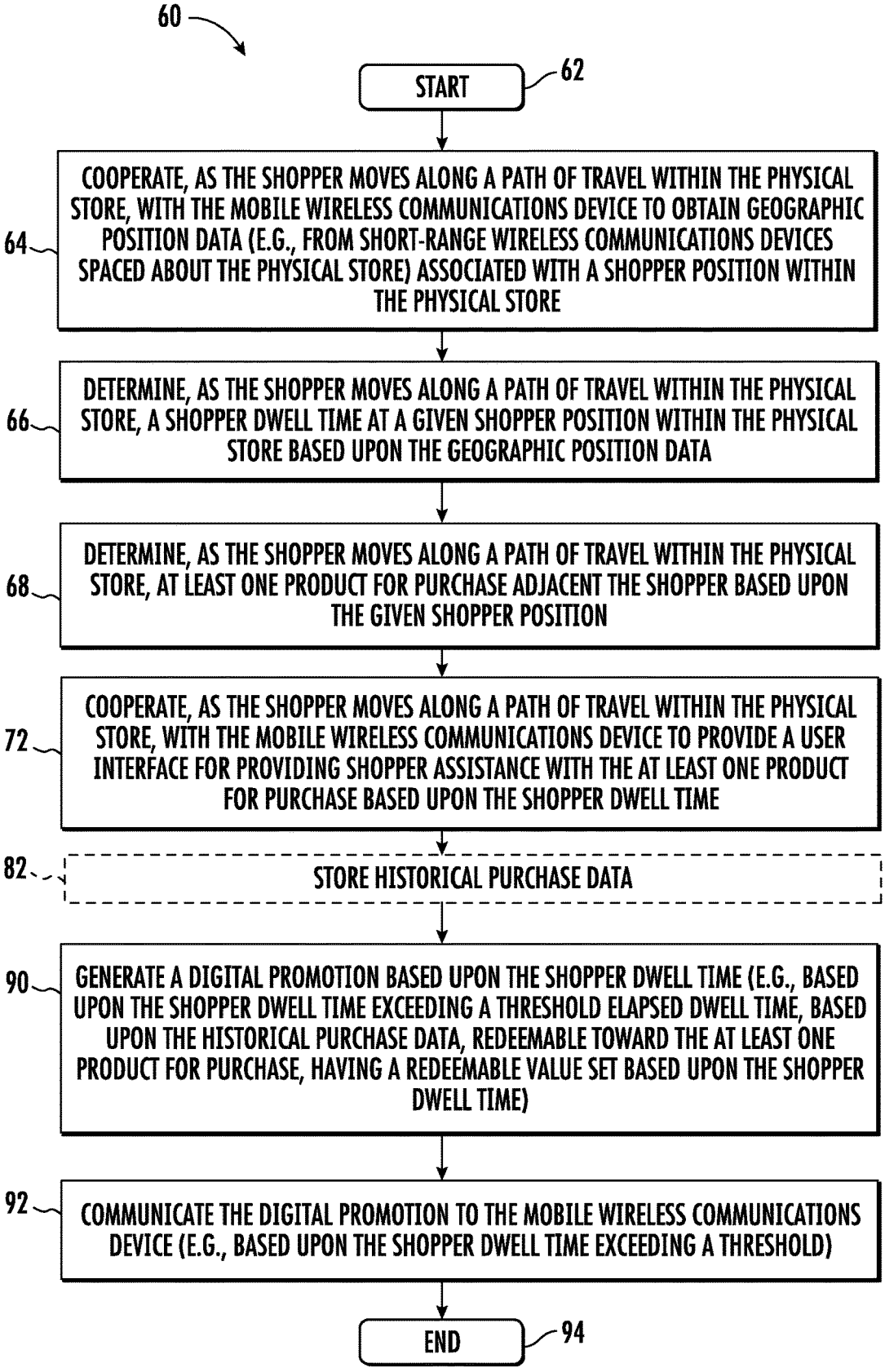

60
START
62
COOPERATE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, WITH THE MOBILE WIRELESS COMMUNICATIONS DEVICE TO OBTAIN GEOGRAPHIC POSITION DATA (E.G., FROM SHORT-RANGE WIRELESS COMMUNICATIONS DEVICES SPACED ABOUT THE PHYSICAL STORE) ASSOCIATED WITH A SHOPPER POSITION WITHIN THE PHYSICAL STORE
64
DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, A SHOPPER DWELL TIME AT A GIVEN SHOPPER POSITION WITHIN THE PHYSICAL STORE BASED UPON THE GEOGRAPHIC POSITION DATA
66
DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, AT LEAST ONE PRODUCT FOR PURCHASE ADJACENT THE SHOPPER BASED UPON THE GIVEN SHOPPER POSITION
68
COOPERATE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, WITH THE MOBILE WIRELESS COMMUNICATIONS DEVICE TO PROVIDE A USER INTERFACE FOR PROVIDING SHOPPER ASSISTANCE WITH THE AT LEAST ONE PRODUCT FOR PURCHASE BASED UPON THE SHOPPER DWELL TIME
72
STORE HISTORICAL PURCHASE DATA
82
GENERATE A DIGITAL PROMOTION BASED UPON THE SHOPPER DWELL TIME (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD ELAPSED DWELL TIME, BASED UPON THE HISTORICAL PURCHASE DATA, REDEEMABLE TOWARD THE AT LEAST ONE PRODUCT FOR PURCHASE, HAVING A REDEEMABLE VALUE SET BASED UPON THE SHOPPER DWELL TIME)
90
COMMUNICATE THE DIGITAL PROMOTION TO THE MOBILE WIRELESS COMMUNICATIONS DEVICE (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD)
92
END
94

FIG. 5

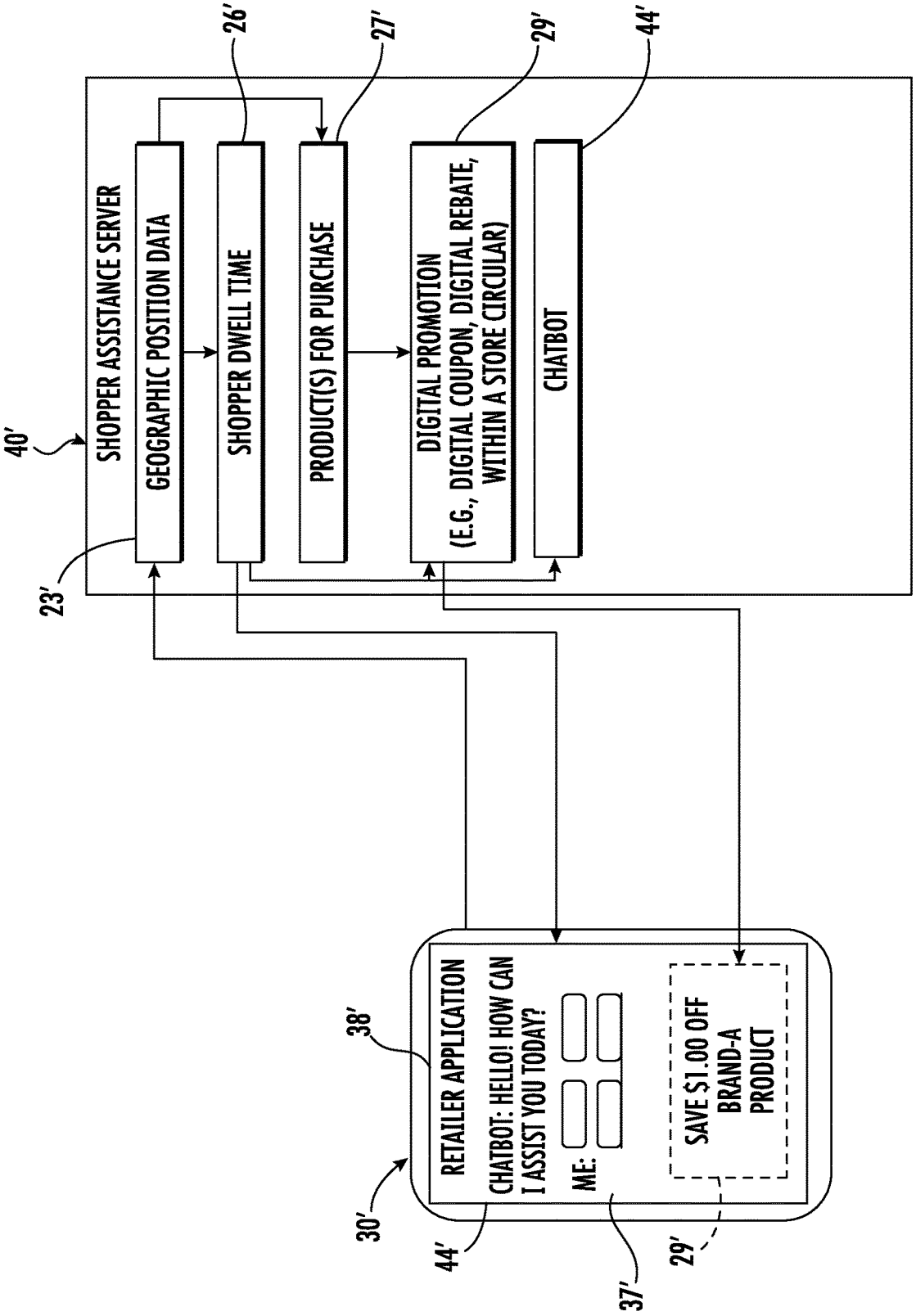

40'
SHOPPER ASSISTANCE SERVER
GEOGRAPHIC POSITION DATA
SHOPPER DWELL TIME
PRODUCT(S) FOR PURCHASE
DIGITAL PROMOTION (E.G., DIGITAL COUPON, DIGITAL REBATE, WITHIN A STORE CIRCULAR)
CHATBOT
23'
26'
27'
29'
44'
38'
30'
44'
37'
29'
RETAILER APPLICATION
CHATBOT: HELLO! HOW CAN I ASSIST YOU TODAY?
ME:
SAVE $1.00 OFF BRAND-A PRODUCT

FIG. 6

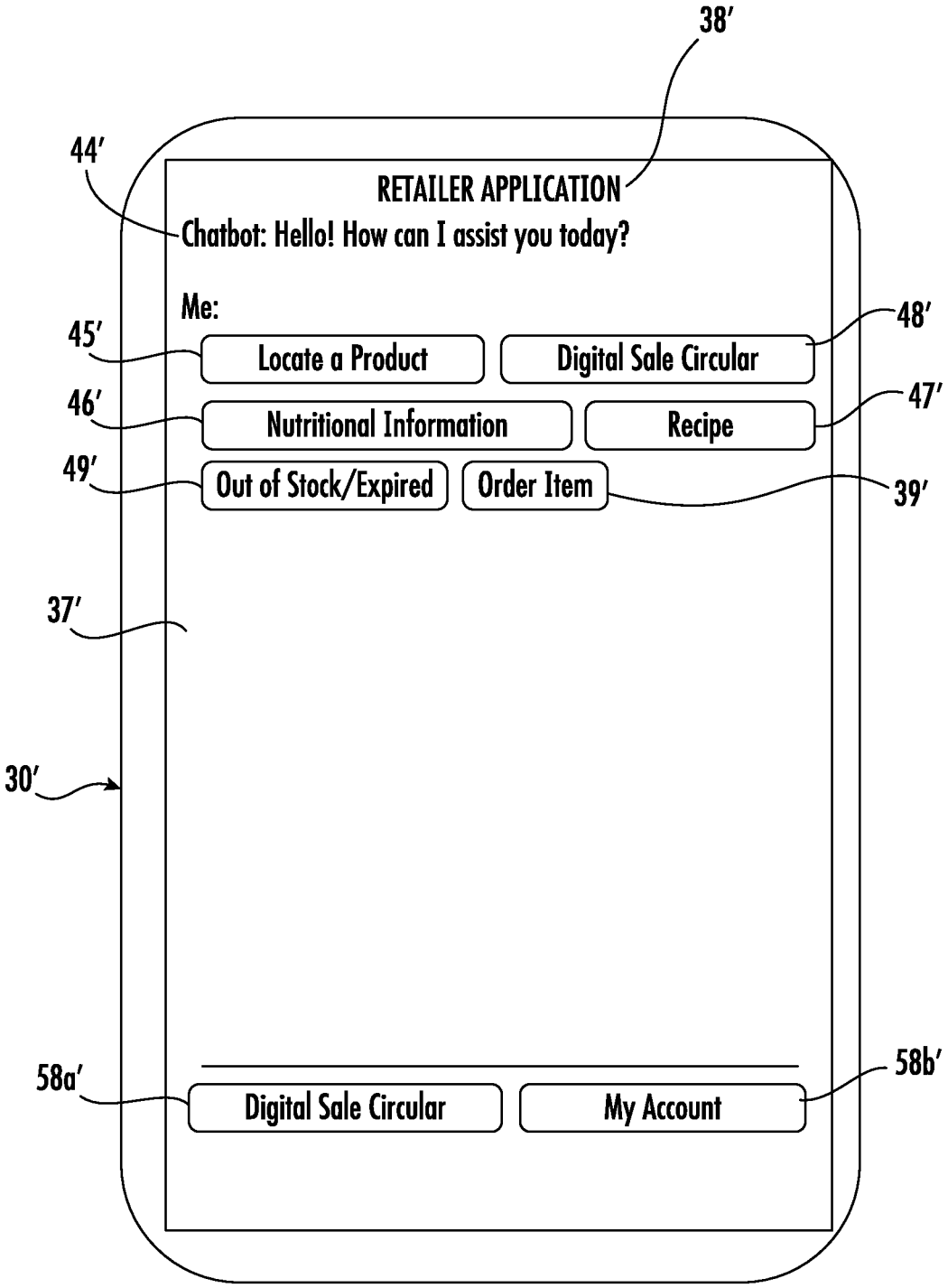

38′
44′
RETAILER APPLICATION
Chatbot: Hello! How can I assist you today?
Me:
45′
Locate a Product
Digital Sale Circular
48′
46′
Nutritional Information
Recipe
47′
49′
Out of Stock/Expired
Order Item
39′
37′
30′
58a′
Digital Sale Circular
My Account
58b′

FIG. 7

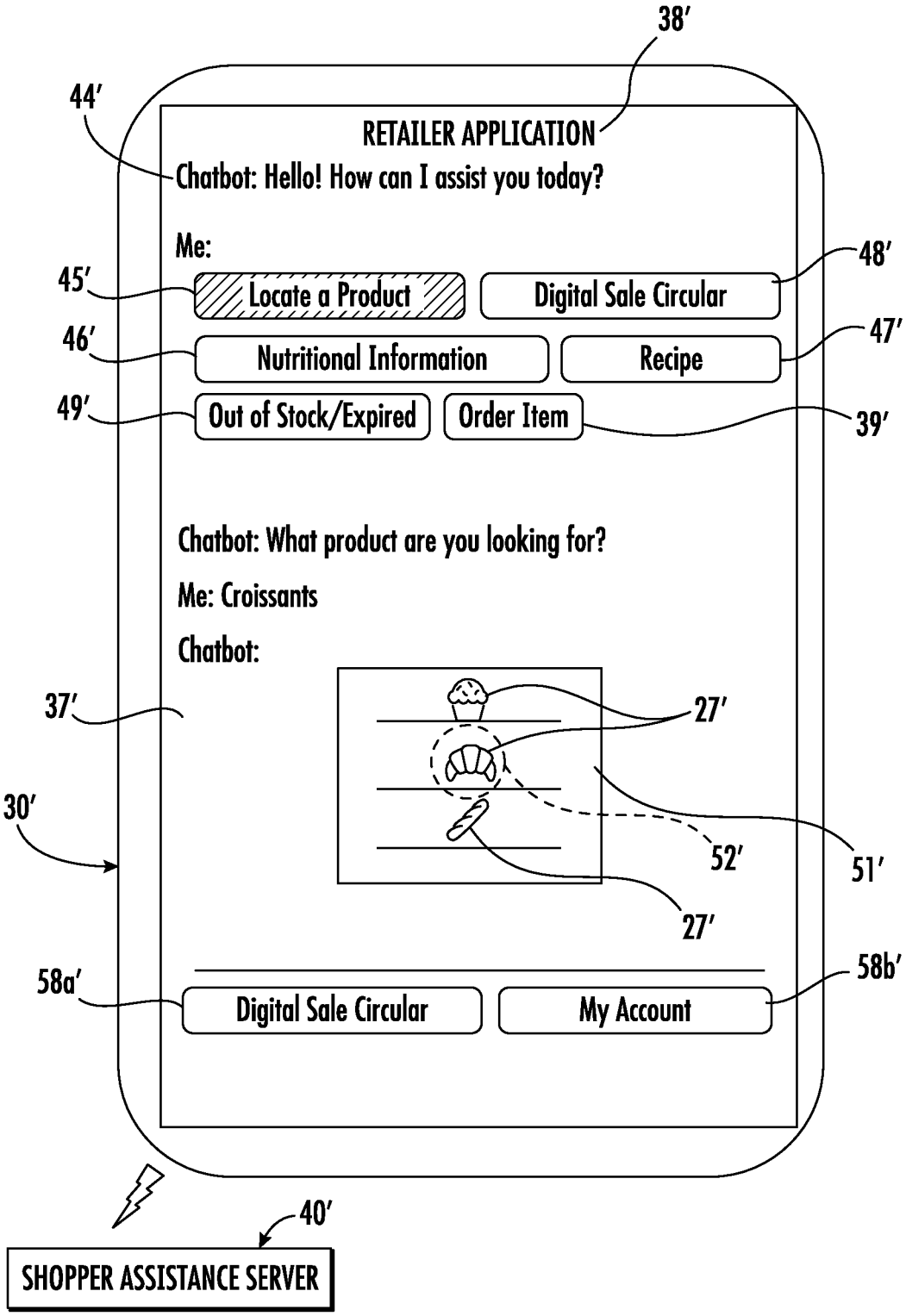

38′
44′
RETAILER APPLICATION
Chatbot: Hello! How can I assist you today?
Me:
45′
Locate a Product
Digital Sale Circular
48′
46′
Nutritional Information
Recipe
47′
49′
Out of Stock/Expired
Order Item
39′
Chatbot: What product are you looking for?
Me: Croissants
Chatbot:
37′
27′
30′
52′
51′
27′
58a′
Digital Sale Circular
My Account
58b′
40′
SHOPPER ASSISTANCE SERVER

FIG. 8

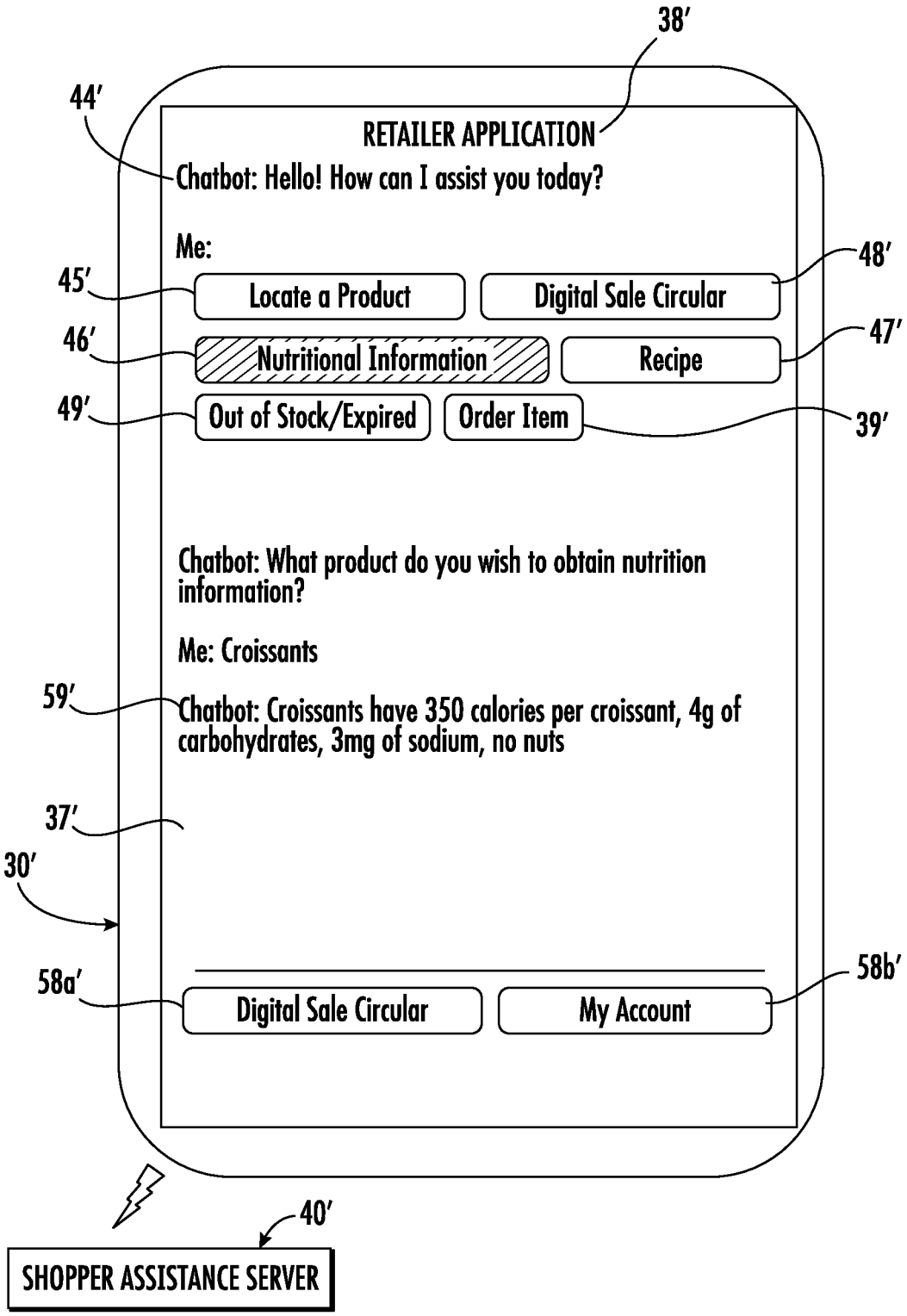

38′
44′
RETAILER APPLICATION
Chatbot: Hello! How can I assist you today?
Me:
45′
Locate a Product
Digital Sale Circular
48′
46′
Nutritional Information
Recipe
47′
49′
Out of Stock/Expired
Order Item
39′
Chatbot: What product do you wish to obtain nutrition information?
Me: Croissants
59′
Chatbot: Croissants have 350 calories per croissant, 4g of carbohydrates, 3mg of sodium, no nuts
37′
30′
58a′
Digital Sale Circular
My Account
58b′
40′
SHOPPER ASSISTANCE SERVER

FIG. 9

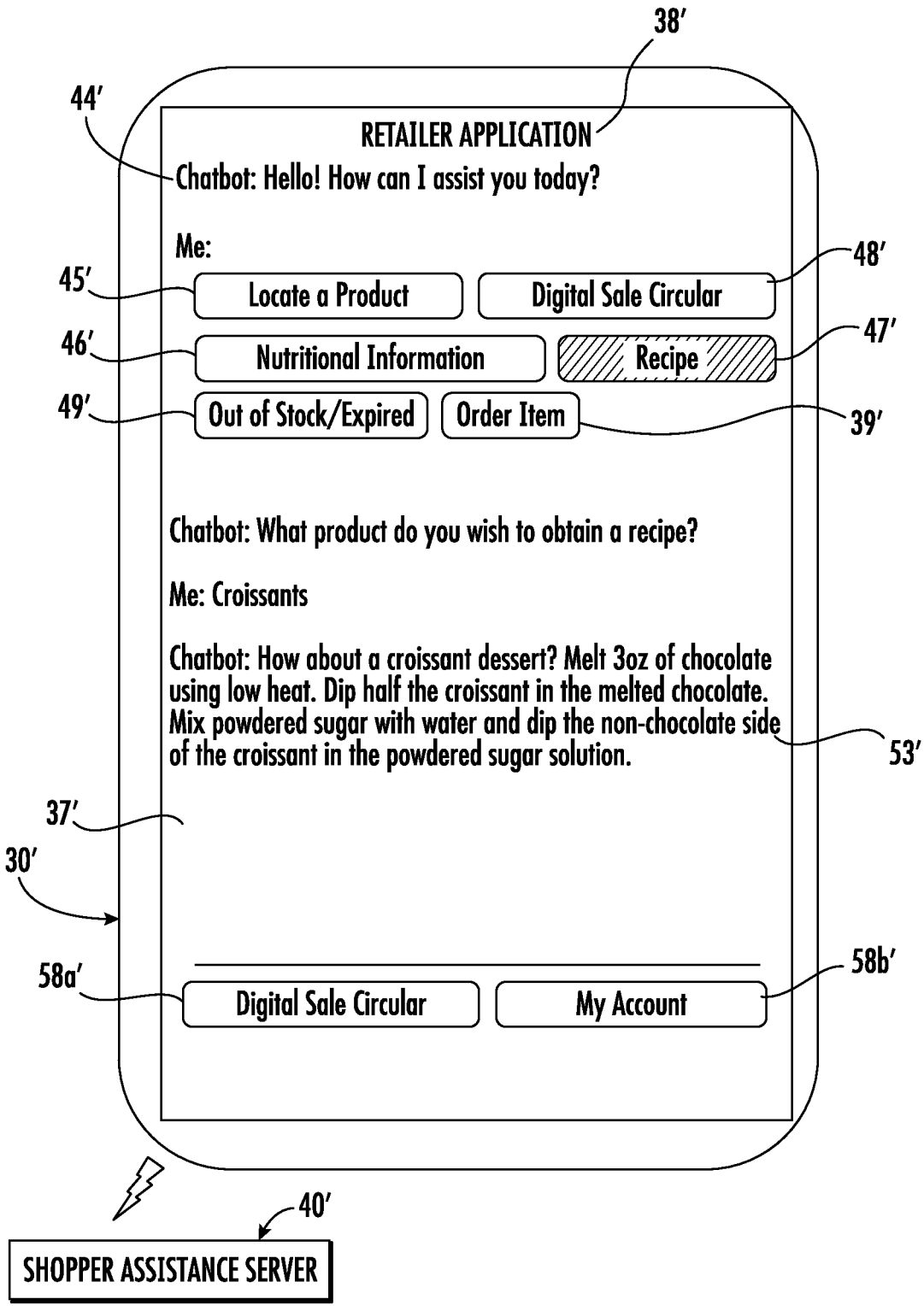

38′
44′
RETAILER APPLICATION
Chatbot: Hello! How can I assist you today?
Me:
45′
Locate a Product
Digital Sale Circular
48′
46′
Nutritional Information
Recipe
47′
49′
Out of Stock/Expired
Order Item
39′
Chatbot: What product do you wish to obtain a recipe?
Me: Croissants
Chatbot: How about a croissant dessert? Melt 3oz of chocolate using low heat. Dip half the croissant in the melted chocolate. Mix powdered sugar with water and dip the non-chocolate side of the croissant in the powdered sugar solution.
53′
37′
30′
58a′
58b′
Digital Sale Circular
My Account
40′
SHOPPER ASSISTANCE SERVER

FIG. 10

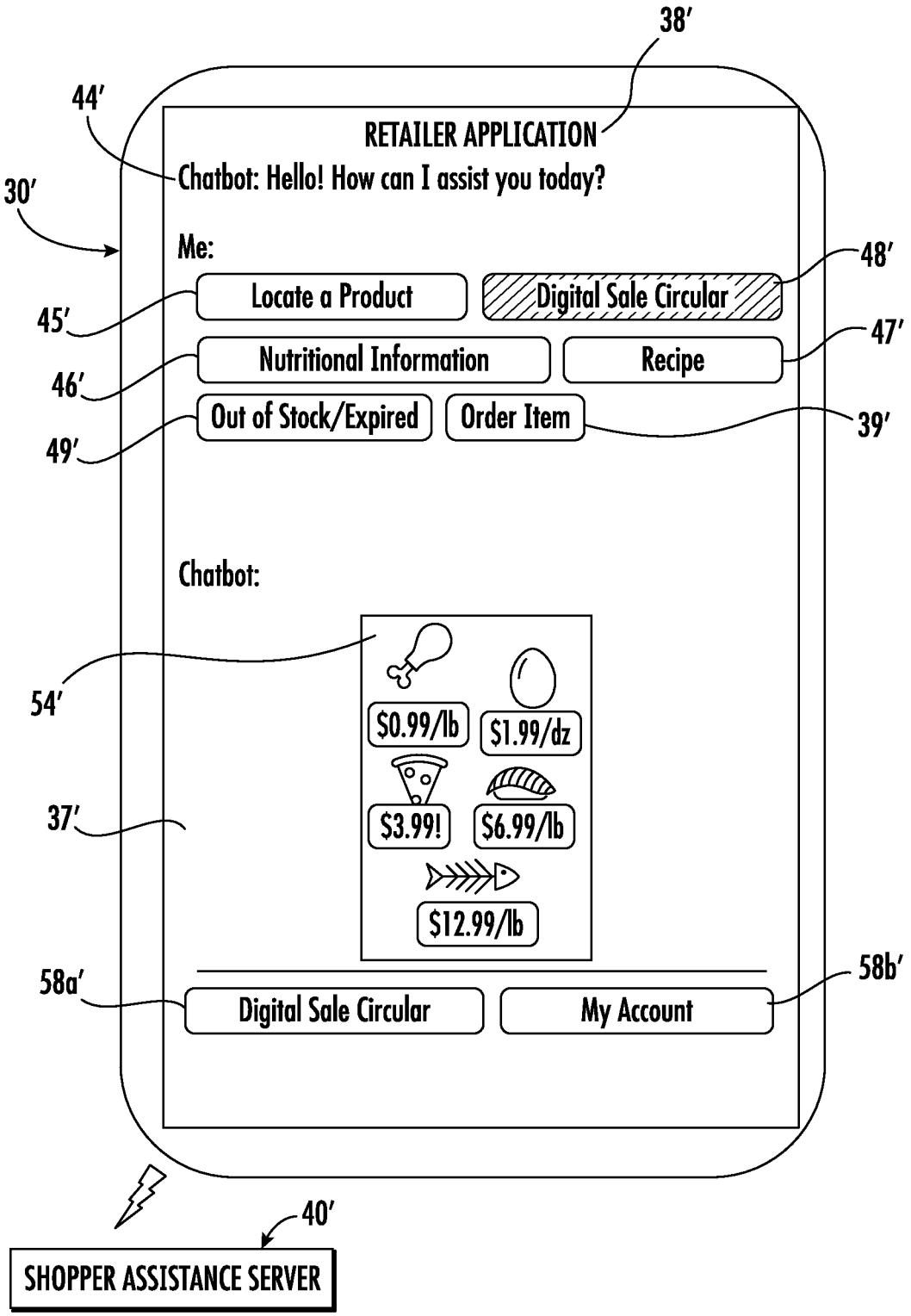

38′
44′
RETAILER APPLICATION
Chatbot: Hello! How can I assist you today?
30′
Me:
48′
Locate a Product
Digital Sale Circular
45′
47′
Nutritional Information
Recipe
46′
Out of Stock/Expired
Order Item
39′
49′
Chatbot:
54′
$0.99/lb
$1.99/dz
37′
$3.99!
$6.99/lb
$12.99/lb
58a′
58b′
Digital Sale Circular
My Account
40′
SHOPPER ASSISTANCE SERVER

FIG. 11

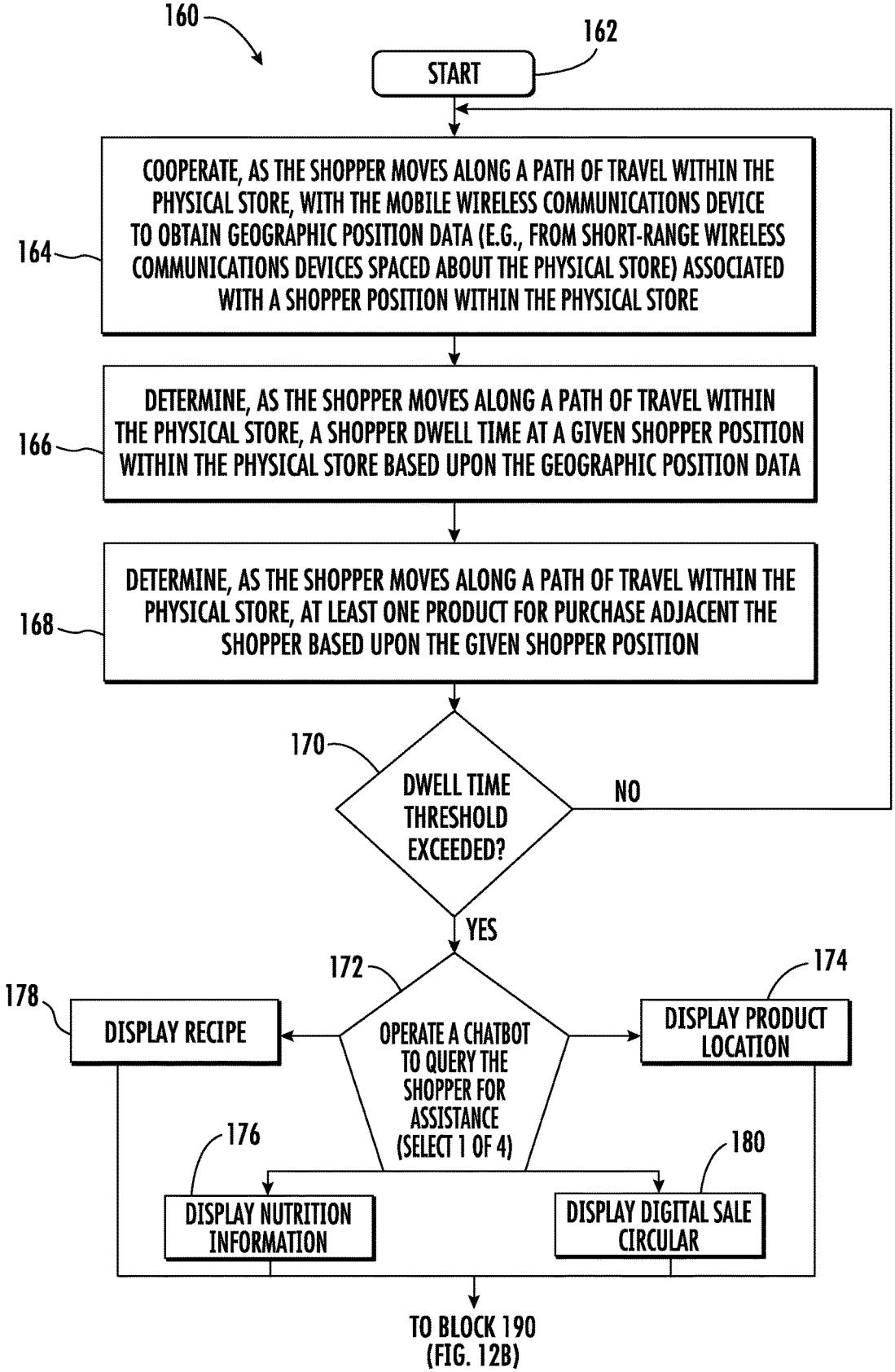

160
162
START
COOPERATE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, WITH THE MOBILE WIRELESS COMMUNICATIONS DEVICE TO OBTAIN GEOGRAPHIC POSITION DATA (E.G., FROM SHORT-RANGE WIRELESS COMMUNICATIONS DEVICES SPACED ABOUT THE PHYSICAL STORE) ASSOCIATED WITH A SHOPPER POSITION WITHIN THE PHYSICAL STORE
164
DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, A SHOPPER DWELL TIME AT A GIVEN SHOPPER POSITION WITHIN THE PHYSICAL STORE BASED UPON THE GEOGRAPHIC POSITION DATA
166
DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, AT LEAST ONE PRODUCT FOR PURCHASE ADJACENT THE SHOPPER BASED UPON THE GIVEN SHOPPER POSITION
168
170
DWELL TIME THRESHOLD EXCEEDED?
NO
YES
172
OPERATE A CHATBOT TO QUERY THE SHOPPER FOR ASSISTANCE (SELECT 1 OF 4)
174
DISPLAY PRODUCT LOCATION
178
DISPLAY RECIPE
176
DISPLAY NUTRITION INFORMATION
180
DISPLAY DIGITAL SALE CIRCULAR
TO BLOCK 190 (FIG. 12B)

FIG. 12A

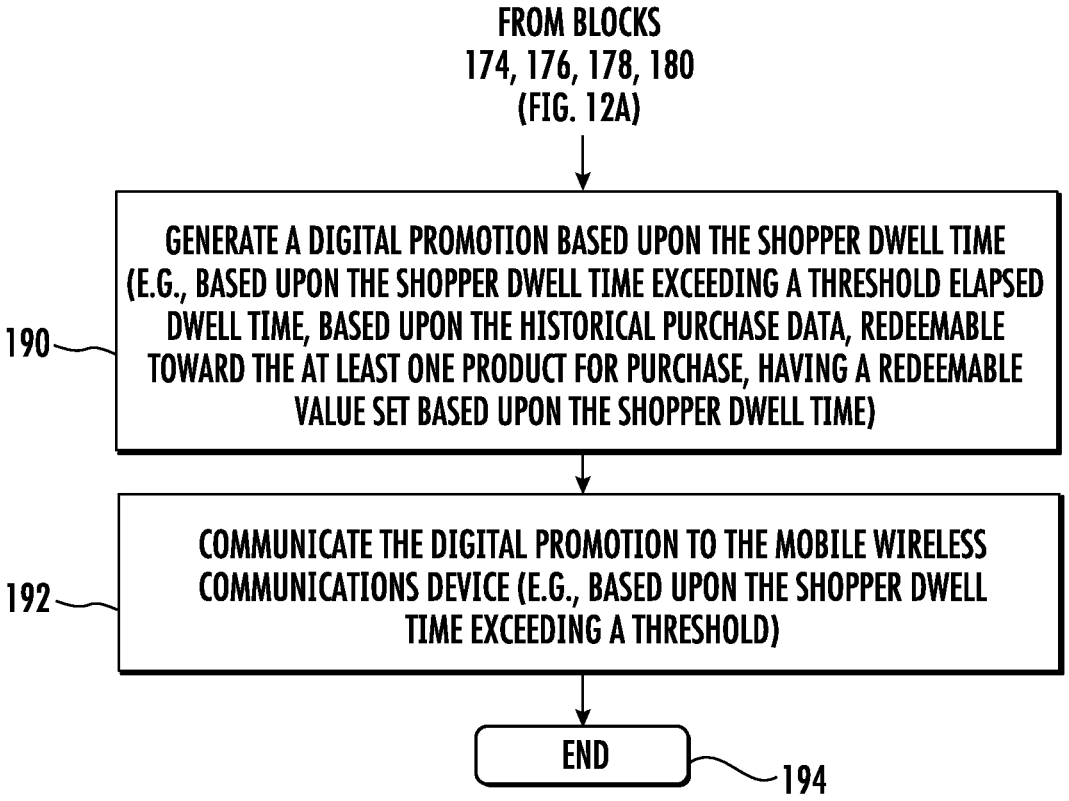

FROM BLOCKS
174, 176, 178, 180
(FIG. 12A)
GENERATE A DIGITAL PROMOTION BASED UPON THE SHOPPER DWELL TIME (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD ELAPSED DWELL TIME, BASED UPON THE HISTORICAL PURCHASE DATA, REDEEMABLE TOWARD THE AT LEAST ONE PRODUCT FOR PURCHASE, HAVING A REDEEMABLE VALUE SET BASED UPON THE SHOPPER DWELL TIME)
190
COMMUNICATE THE DIGITAL PROMOTION TO THE MOBILE WIRELESS COMMUNICATIONS DEVICE (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD)
192
END
194

FIG. 12B

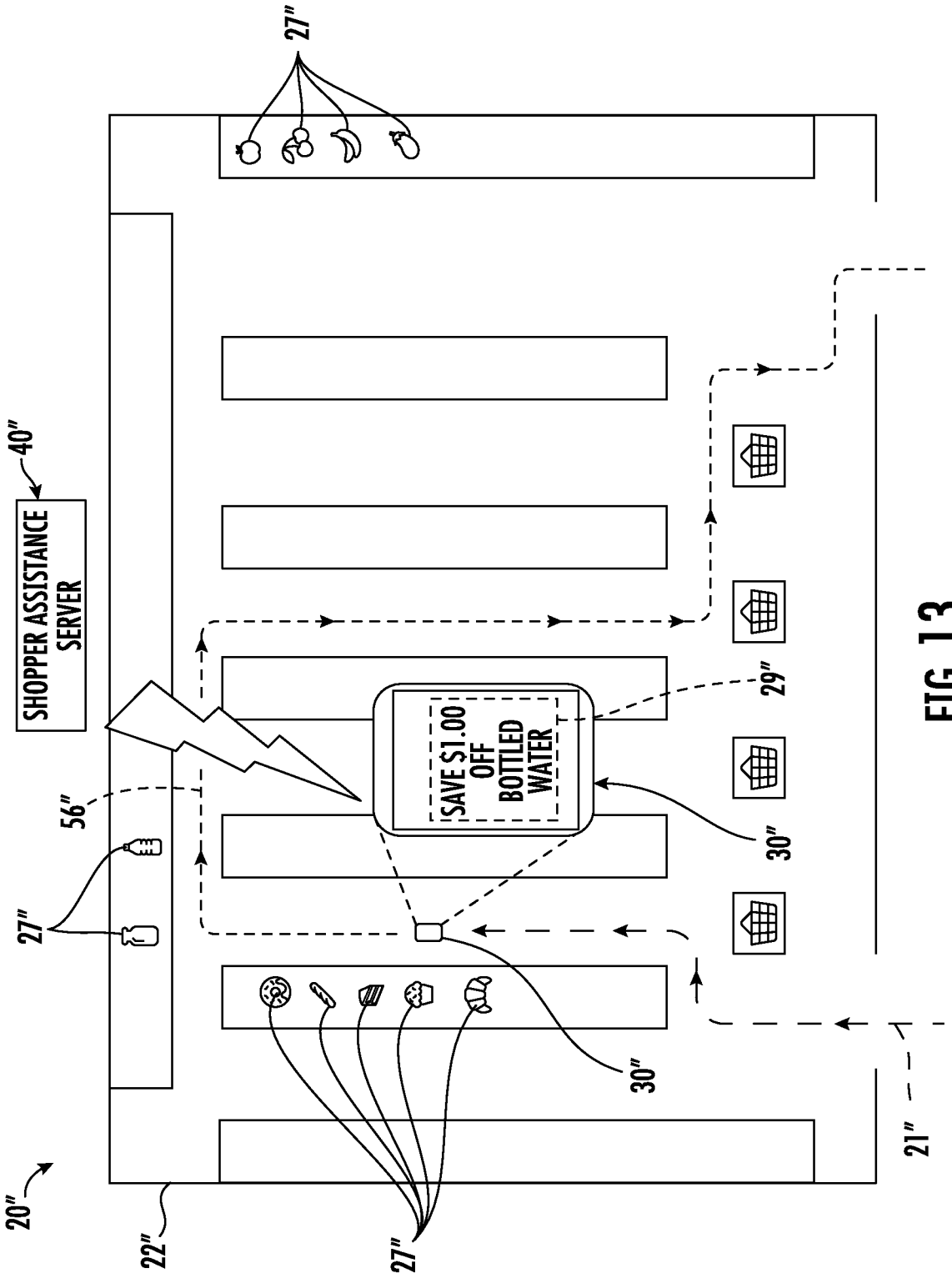

27"
40"
SHOPPER ASSISTANCE SERVER
SAVE $1.00 OFF BOTTLED WATER
29"
30"
56"
27"
30"
21"
20"
22"
27"

FIG. 13

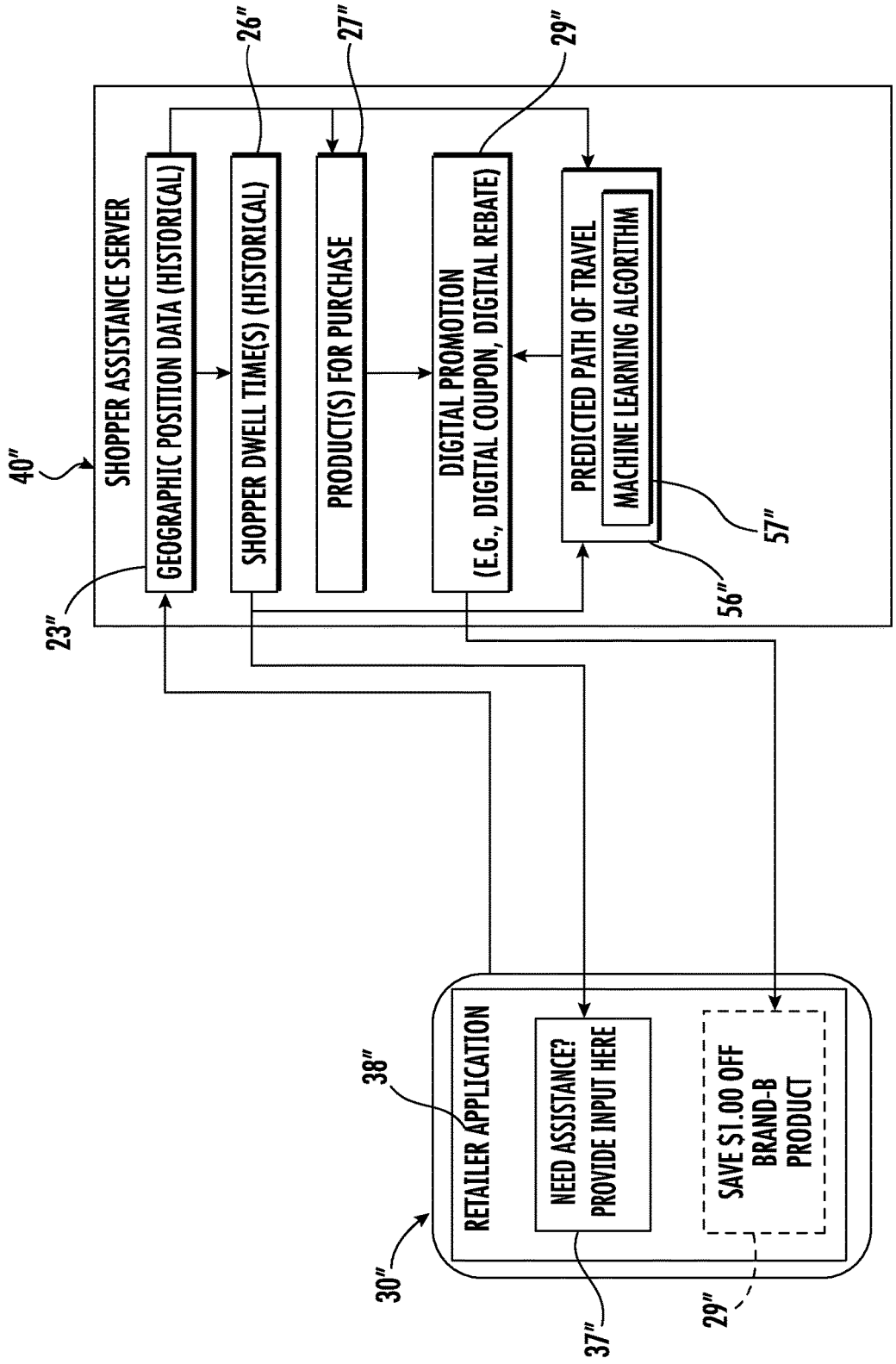

40"
SHOPPER ASSISTANCE SERVER
GEOGRAPHIC POSITION DATA (HISTORICAL)
SHOPPER DWELL TIME(S) (HISTORICAL)
PRODUCT(S) FOR PURCHASE
DIGITAL PROMOTION (E.G., DIGITAL COUPON, DIGITAL REBATE)
PREDICTED PATH OF TRAVEL
MACHINE LEARNING ALGORITHM
26"
27"
29"
23"
56"
57"
38"
30"
RETAILER APPLICATION
NEED ASSISTANCE? PROVIDE INPUT HERE
SAVE $1.00 OFF BRAND-B PRODUCT
37"
29"

FIG. 14

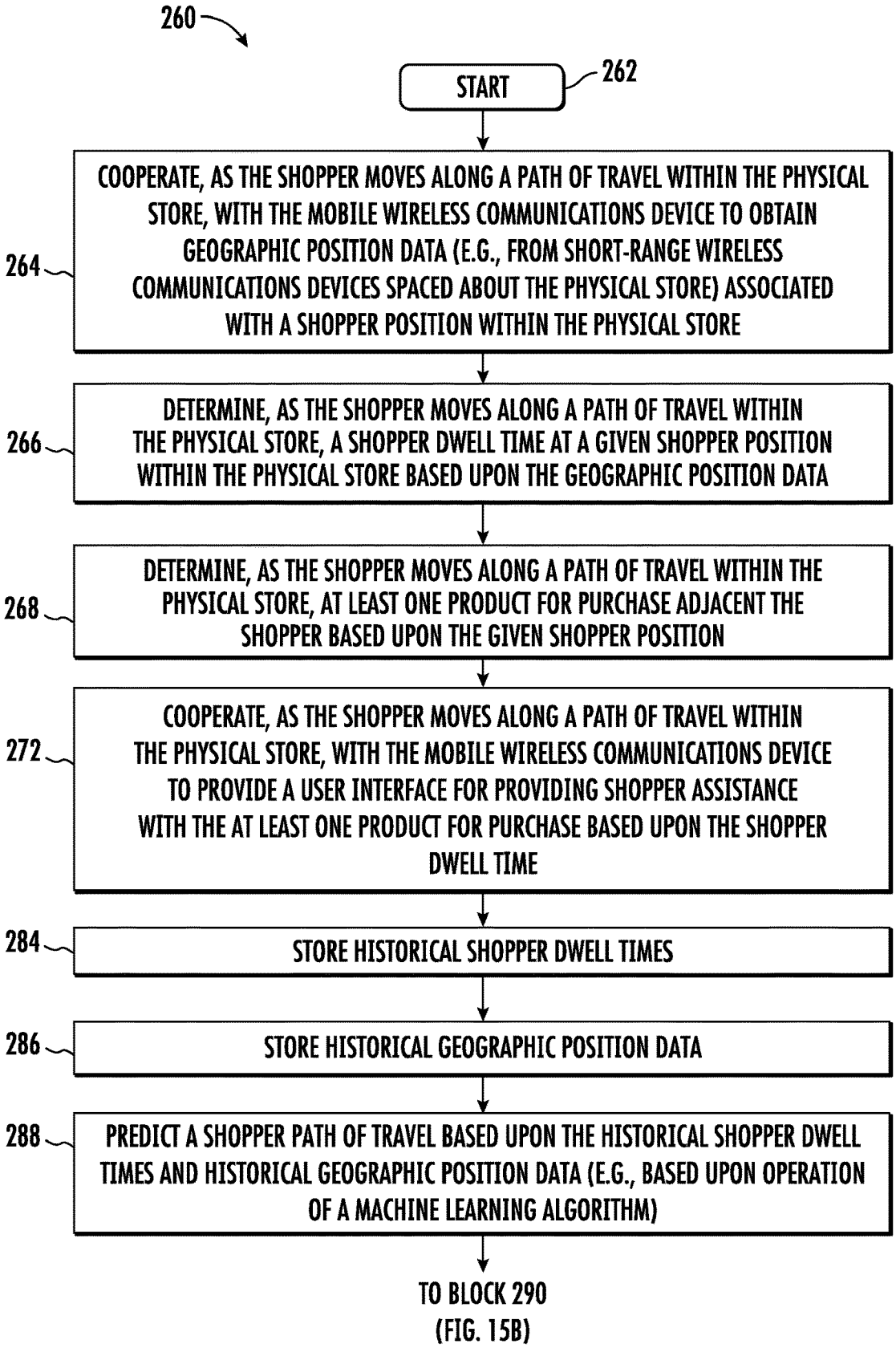

260
START
262
COOPERATE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, WITH THE MOBILE WIRELESS COMMUNICATIONS DEVICE TO OBTAIN GEOGRAPHIC POSITION DATA (E.G., FROM SHORT-RANGE WIRELESS COMMUNICATIONS DEVICES SPACED ABOUT THE PHYSICAL STORE) ASSOCIATED WITH A SHOPPER POSITION WITHIN THE PHYSICAL STORE
264
DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, A SHOPPER DWELL TIME AT A GIVEN SHOPPER POSITION WITHIN THE PHYSICAL STORE BASED UPON THE GEOGRAPHIC POSITION DATA
266
DETERMINE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, AT LEAST ONE PRODUCT FOR PURCHASE ADJACENT THE SHOPPER BASED UPON THE GIVEN SHOPPER POSITION
268
COOPERATE, AS THE SHOPPER MOVES ALONG A PATH OF TRAVEL WITHIN THE PHYSICAL STORE, WITH THE MOBILE WIRELESS COMMUNICATIONS DEVICE TO PROVIDE A USER INTERFACE FOR PROVIDING SHOPPER ASSISTANCE WITH THE AT LEAST ONE PRODUCT FOR PURCHASE BASED UPON THE SHOPPER DWELL TIME
272
STORE HISTORICAL SHOPPER DWELL TIMES
284
STORE HISTORICAL GEOGRAPHIC POSITION DATA
286
PREDICT A SHOPPER PATH OF TRAVEL BASED UPON THE HISTORICAL SHOPPER DWELL TIMES AND HISTORICAL GEOGRAPHIC POSITION DATA (E.G., BASED UPON OPERATION OF A MACHINE LEARNING ALGORITHM)
288
TO BLOCK 290
(FIG. 15B)

FIG. 15A

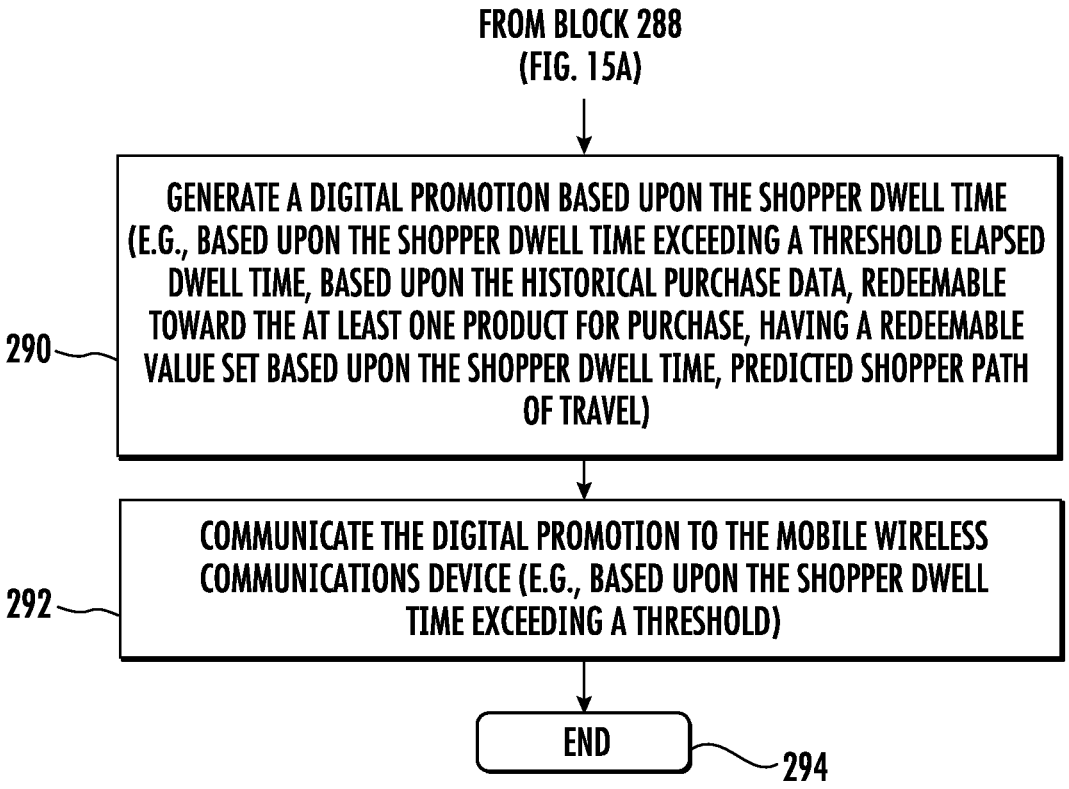

FROM BLOCK 288
(FIG. 15A)
GENERATE A DIGITAL PROMOTION BASED UPON THE SHOPPER DWELL TIME (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD ELAPSED DWELL TIME, BASED UPON THE HISTORICAL PURCHASE DATA, REDEEMABLE TOWARD THE AT LEAST ONE PRODUCT FOR PURCHASE, HAVING A REDEEMABLE VALUE SET BASED UPON THE SHOPPER DWELL TIME, PREDICTED SHOPPER PATH OF TRAVEL)
290
COMMUNICATE THE DIGITAL PROMOTION TO THE MOBILE WIRELESS COMMUNICATIONS DEVICE (E.G., BASED UPON THE SHOPPER DWELL TIME EXCEEDING A THRESHOLD)
292
END
294

FIG. 15B

SHOPPER ASSISTANCE SYSTEM BASED UPON SHOPPER DWELL TIME AND RELATED METHODS

TECHNICAL FIELD

The present invention relates to the field of providing shopper assistance, and, more particularly, to providing shopper assistance based upon a shopper dwell time, and related methods.

BACKGROUND

Sales of a particular product or service may be based upon how well that product or service is marketed to a consumer. One form of marketing or promotion is a coupon, typically in paper form, for a discount toward the product or service. Some coupons may be retailer specific, for example, only redeemable for the discount at a particular retailer, while other coupons may be product specific from a manufacturer and redeemable at any retailer.

A coupon, while typically in paper form, may be in digital form and may be referred to as a digital promotion. A digital promotion may be selected or "clipped" via a mobile phone and saved to a digital wallet for redemption at a point-of-sale (POS) terminal, for example. A typical coupon is applicable to a given product and has a redeemable value that may vary based upon, for example, the quantity of a given item, brand of item, size of the product in terms of packaging, and/or the price point of the given item. A typical coupon may also be redeemable only at a given retailer and/or within a threshold time period.

SUMMARY

A shopper assistance system may include a mobile wireless communications device associated with a shopper and a shopper assistance server. The shopper assistance server may be configured to, as the shopper moves along a path of travel within a physical store, cooperate with the mobile wireless communications device to obtain geographic position data associated with a shopper position within the physical store, and determine a shopper dwell time at a given shopper position within the physical store based upon the geographic position data. The shopper assistance server may also be configured to, as the shopper moves along the path of travel within the physical store, determine at least one product for purchase adjacent the shopper based upon the given shopper position and cooperate with the mobile wireless communications device to provide a user interface for providing shopper assistance with the at least one product for purchase based upon the shopper dwell time. The shopper assistance server may be further configured to, as the shopper moves along the path of travel within the physical store, generate and communicate to the mobile wireless communications device a digital promotion based upon the shopper dwell time.

The shopper assistance server may be configured to operate a chatbot via the user interface based upon the shopper dwell time. The shopper assistance server may be configured to operate the chatbot to prompt the shopper to select one of whether the shopper cannot locate the at least one product for purchase, the shopper would like nutrition information associated with the at least one product for purchase, and the shopper would like a recipe associated with the at least one product for purchase, for example.

The shopper assistance server may be configured to generate and communicate the digital promotion to the shopper based upon the shopper dwell time exceeding a threshold elapsed dwell time. The at least one product for purchase may include a plurality of products for purchase, and the shopper assistance server may be configured to, via the user interface, display a portion of a digital sale circular corresponding to at least one discounted product for purchase from among the plurality of products for purchase adjacent the shopper, for example.

The shopper assistance system may further include a plurality of short-range wireless communications devices spaced about the physical store. The shopper assistance server may be configured to obtain geographic position data based upon the plurality of short-range wireless communications devices, for example.

The shopper assistance server may be configured to store a plurality of historical shopper dwell times and store historical geographic position data associated with the shopper. The shopper assistance server may further be configured to predict a shopper path of travel based upon the plurality of historical shopper dwell times and historical geographic position data and generate the digital promotion based upon the predicted shopper path of travel, for example. The shopper assistance server may be configured to operate a machine learning algorithm to predict the shopper path of travel, for example.

The shopper assistance server may be configured to generate the digital promotion to be redeemable toward the at least one product for purchase adjacent the shopper. The digital promotion may have a redeemable value associated therewith, and the shopper assistance server may be configured to set the redeemable value based upon the shopper dwell time, for example. The shopper assistance server may be configured to store historical product purchase data for the shopper and generate the digital promotion based upon the historical product purchase data.

A method aspect is directed to a method of assisting a shopper. The method may include using a shopper assistance server to, as a shopper moves along a path of travel within a physical store, cooperate with a mobile wireless communications device associated with the shopper to obtain geographic position data associated with a shopper position within the physical store, and determine a shopper dwell time at a given shopper position within the physical store based upon the geographic position data. The method may further include using the shopper assistance server to, as the shopper moves along the path of travel within the physical store, determine at least one product for purchase adjacent the shopper based upon the given shopper position, and cooperate with the mobile wireless communications device to provide a user interface for providing shopper assistance with the at least one product for purchase based upon the shopper dwell time. The method may further include using the shopper assistance server to, as the shopper moves along the path of travel within the physical store, generate and communicate to the mobile wireless communications device a digital promotion based upon the shopper dwell time.

A computer readable medium aspect is directed to a non-transitory computer readable medium that includes computer executable instructions that when executed by a processor cause the processor to perform operations. The operations may include, as a shopper moves along a path of travel within a physical store, cooperating with a mobile wireless communications device associated with the shopper to obtain geographic position data associated with a shopper position within the physical store and determining a shopper

dwell time at a given shopper position within the physical store based upon the geographic position data. The operations may also include, as the shopper moves along the path of travel within the physical store, determining at least one product for purchase adjacent the shopper based upon the given shopper position and cooperating with the mobile wireless communications device to provide a user interface for providing shopper assistance with the at least one product for purchase based upon the shopper dwell time. The operations further include, as the shopper moves along the path of travel within the physical store, generating and communicating to the mobile wireless communications device a digital promotion based upon the shopper dwell time.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic diagram of a shopper assistance system in accordance with an embodiment.

FIG. **2** is a schematic operational block diagram of the shopper assistance system of FIG. **1**.

FIG. **3** is a schematic block diagram of the mobile wireless communications device of the shopper assistance system of FIG. **1**.

FIG. **4** is a schematic block diagram of the shopper assistance server of the shopper assistance system of FIG. **1**.

FIG. **5** is a flow chart illustrating operation of the shopper assistance server of the shopper assistance system of FIG. **1**.

FIG. **6** is a schematic diagram of a shopper assistance system in accordance with another embodiment.

FIG. **7** is a diagram of exemplary operation of a user interface of a mobile wireless communications device in accordance with the embodiment in FIG. **6**.

FIG. **8** is another diagram of exemplary operation of the user interface of a mobile wireless communications device in accordance with the embodiment in FIG. **6**.

FIG. **9** is another diagram of exemplary operation of the user interface of a mobile wireless communications device in accordance with the embodiment in FIG. **6**.

FIG. **10** is another diagram of exemplary operation of the user interface of a mobile wireless communications device in accordance with the embodiment in FIG. **6**.

FIG. **11** is another diagram of exemplary operation of the user interface of a mobile wireless communications device in accordance with the embodiment in FIG. **6**.

FIGS. **12***a* and **12***b* are flow charts illustrating operation of the shopper assistance server of the shopper assistance system of FIG. **6**.

FIG. **13** is a schematic diagram of a shopper assistance system in accordance with another embodiment.

FIG. **14** is a schematic operational block diagram of the shopper assistance system of FIG. **13**.

FIGS. **15***a* and **15***b* are flow charts illustrating operation of the shopper assistance server of the shopper assistance system of FIG. **13**.

DETAILED DESCRIPTION

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout, and prime and multiple prime notations are used to indicate similar elements in alternative embodiments.

Referring initially to FIGS. **1-4**, a shopper assistance system **20** illustratively includes a mobile wireless communications device **30** associated with a shopper. The mobile wireless communications device **30** is illustratively in the form of a mobile phone or smartphone, and includes a portable housing **31** carrying a controller **32**. Wireless communications circuitry **33** is coupled to the controller **32**. The wireless communications circuitry **33** may include long-range wireless communications circuitry, for example, cellular or satellite (e.g., GPS) communications circuitry. The wireless communications circuitry **33** may include mid-range wireless communications circuitry (e.g., WiFi, beacon technology), and/or short-range wireless communications circuitry (e.g., Bluetooth, NFC, beacon technology). Of course, the wireless communications circuitry **33** may include other and/or additional wireless communications circuitry, for example, to support other and/or additional wireless communications protocols, and/or provide a geofencing function.

The mobile wireless communications device **30** may also include a display **34** coupled to the controller **32**. The display **34** may be in the form of a touch-screen display, for example, to accept user input thereto. While the mobile wireless communications device **30** has been described as in the form of mobile phone, those skilled in the art will appreciate that the mobile wireless communications device may be another type of mobile device, for example, a tablet computer, a personal computer, a laptop computer, or wearable computer.

The shopper assistance system **20** also includes a shopper assistance server **40**. The shopper assistance server **40** includes a processor **41** and an associated memory **42**. While operations of the shopper assistance server **40** are described herein, those skilled in the art will appreciate that the processor **41** and memory **42** cooperate to perform the operations.

The mobile wireless communications device **30** may operate a retailer application **38** or application associated with one or more physical stores **22**. The retailer application **38** may operate based upon an application programming interface (API) plugin, for example, to a retailer mobile e-commerce platform, inventory warehouse management system (WMS), loyalty shopper customer relationship management (CRM), planogram, and/or POS historical purchase history, that makes API function calls to the shopper assistance server **40**. The retailer application **38** may operate a user interface **37** within the retailer application that performs shopper interface operations. For example, the retailer application **38** may cooperate to display a virtual three-dimensional (3D) store and aisle layout to assist the shopper in navigating the physical store **22**. The retailer application **38** may provide product list functions and multimedia content regarding products for purchase **27**. The retailer application **38** may also provide a most efficient path of travel through the physical store **22** based upon the product list for the shopper.

The retailer application **38** may also operate to function as a product identifier reader (e.g., barcode or machine readable code reader) to permit price checking or to obtain other product information, such as, for example, stock status, as will be appreciated by those skilled in the art. In an exemplary implementation, a visual indicator (e.g., a red "X" or green "O") may be displayed on the display **34** upon scanning a product for purchase **27** based upon whether the

scanned product for purchase meets certain dietary constraints set by the shopper, for example, within the retailer application **38**.

Referring now to the flowchart **60** in FIG. **5**, beginning at Block **62**, operations of the shopper assistance server **40** will now be described. The operations of the shopper assistance server **40** are performed as the shopper moves along a path of travel **21** within the physical store **22**. At Block **64**, as the shopper moves along the path of travel **21**, the shopper assistance server **40** cooperates with the mobile wireless communications device **30** to obtain geographic position data **23** associated with the physical store **22**. More particularly, the mobile wireless communications device **30** may communicate geographic position data **23** representative of its geographic location within the store, for example, relative to aisles, departments, and/or products for purchase, to the shopper assistance server **40**. The geographic position data **23** may be relative to a global coordinate system (e.g., GPS), and may be received based upon a global positioning system (GPS) receiver, for example, when the wireless communications circuitry **33** include a GPS receiver. The geographic position data **23** may include relative position data, for example, a position relative to communications access points, for example, WiFi access points, cellular communications towers, etc., such that the mobile wireless communications device may apply geolocation techniques to determine its geographic position within the physical store **22**. The geographic position data **23** may include data representative of the geographic position of the mobile wireless communications device and/or raw location data such that the shopper assistance server **40** applies geolocation techniques to determine the shopper position within the physical store **22**.

In some embodiments, the shopper assistance system **20** may include short-range wireless communications devices **24***a*-**24***n* spaced about the physical store **22**. The short-range wireless communications devices **24***a*-**24***n* may be Bluetooth short-range beacons, for example, at known locations or positions within the physical store **22**. The mobile wireless communications device **30** may communicate with ones of the short-range wireless communications devices **24***a*-**24***n* to obtain the geographic position data **23**. For example, the given shopper position within the physical store **22** may be based upon a determined signal strength with adjacent ones of the short-range wireless communications devices **24***a*-**24***n*. In some embodiments, the short-range wireless communications devices **24***a*-**24***n* may communicate with the shopper assistance server **40** (e.g., communicate geographic position data **23**) either independently from or in conjunction with the mobile wireless communications device **30**. For example, geographic position data **23** may be communicated to the shopper assistance server **40** from both the mobile wireless communications device **30** and the short-range wireless communications devices **24***a*-**24***n*, and the shopper assistance server may compare the geographic position data, for example, to obtain a more accurate shopper position within the physical store **22**.

The mobile wireless communications device **40** and/or short-range wireless communications devices **24***a*-**24***n* may communicate, for example, geographic position data **23**, periodically or in real or near-real time, and/or based upon movement of the mobile wireless communications device **30** (e.g., orientation and movement as determined by one or more accelerometers carried by the mobile device housing **31**) as the shopper moves along the path of travel **21** within the physical store **22**. In some embodiments, the rate at which geographic position data **23** is communicated may increase when the shopper is determined to be inside of the physical store **22** and/or shopping within the physical store, for example, as determined by movement or handling of the mobile wireless communications device **30**. The determination techniques of the shopper location may be changeable, for example, based upon the determined shopper location. For example, the mobile wireless communications device **30**, the shopper assistance server **40**, and the short-range wireless communications devices **24***a*-**24***n* may cooperate so that the geographic position data **23** is based upon GPS data outside of the physical store **22**, and becomes based upon WiFi, communications with the short-range communications devices, or other interior geolocation techniques upon the shopper entering the physical store. More particularly, a loss or degradation in GPS signal may be used to switch to another geolocation technique.

The shopper assistance server **40**, at Block **66**, determines a shopper dwell time **26** at the given shopper position within the physical store **22** based upon the geographic position data **23**. More particularly, the shopper assistance server **40**, when the geographic position data **23** is not indicative of the shopper moving along the path of travel, operates a timer to measure an amount of time that the shopper has been stationary. The shopper may be stationary or not moving along the path of travel **21**, for example, when selecting a product for purchase from a shelf or display, reading product information, browsing for product, searching for a product, and/or locating sale and/or pricing information.

The shopper assistance server **40** determines one or more products for purchase **27** adjacent the shopper based upon the given shopper position (Block **68**). The shopper assistance server **40** may determine the products for purchase **27** based upon comparing the given shopper position to known positions within the physical store **21** associated with each of the products for purchase. Accordingly, the shopper assistance server **40** may determine that the shopper has been standing in front of the fresh bread in the bakery for any given amount of time.

The shopper assistance server **40** may store product and dwell times, such that over the course of a shopping trip within the physical store **22**, it may be determined that this given shopper spends more time in the vegetable and bakery sections, and more particularly, adjacent the lettuce and fresh bread. Thus, the shopper assistance server **40** may, for a given shopper, store historical path of travel data, dwell times, and adjacent products, for example, to build a shopper profile. The shopper profile may be used by the shopper assistance server **40** for targeting information, promotions, or other data to the given shopper, as will be appreciated by those skilled in the art.

The shopper assistance server **40** cooperates, at Block **72**, with the mobile wireless communications device **30** to provide a user interface **37** for providing shopper assistance with the product for purchase based upon the shopper dwell time. The user interface **37** may provide, by way of the display **34**, information related to the products for purchase, the physical store **22**, promotions, and recipes, for example. Other and/or additional information may be provided via the user interface **37**. Of course, user input may be accepted via the user interface **37**, for example. In an exemplary implementation, when the shopper is determined to be adjacent a product for purchase for more than a threshold time period based (i.e., the shopper dwell time exceeds a dwell time threshold), the shopper assistance server **40** may prompt the shopper, via the user interface **37**, for assistance. Further details of the user interface **37** will be described below.

The shopper assistance server **40** may optionally store historical purchase data **28** for the shopper (Block **82**). The historical purchase data **28** may include previous purchase information, for example, product identifiers (e.g., SKU, PLU, UPC), product descriptions, quantities, date and time, physical store location, and whether a promotion or promotions were applied. The historical purchase data **28** may be obtained from point-of-sale (POS) devices, for example, as products are being purchased, scanned at the POS device, or scanned to the shopping cart/shopping basket. In other words, as products are being purchased at POS devices, the historical purchase data **28** is being updated.

The shopper assistance server **40**, at Block **90**, generates a digital promotion **29** based upon the shopper dwell time **26**. For example, the shopper assistance server **40** may generate the digital promotion **29** for an adjacent product for purchase **27** when the shopper dwell time **26** exceeds a promotion threshold corresponding to an elapsed dwell time. The promotion threshold may be set to the same time threshold as the one described above with respect to the providing the user interface **37**. Of course, the promotion threshold may be different, for example, longer, than the interface for providing the user interface.

The digital promotion **29** may be generated for a specific brand of product for purchase adjacent the shopper. More particularly, the shopper assistance server **40** may generate the digital promotion **29** based upon the historical product purchase data **28**. For example, if the shopper typically purchases Brand-A products, the digital promotion **29** may be redeemable toward Brand-A products. Alternatively, the digital promotion **29** may be redeemable toward Brand-B products, for example, in an attempt to entice the shopper to try another brand of products. Other aspects of the historical product purchase data **28** may be used as a basis for generating the digital promotion **29**, for example, product variations (e.g., flavor, size).

The digital promotion **29** may be in the form of a digital coupon, for example, having a redeemable value for a dollar amount off or percent discount off the purchase price of the product for purchase. The digital promotion **29** may, alternatively, be in the form of a digital rebate.

In an embodiment, the shopper assistance server **40** may set the redeemable value based upon the shopper dwell time. For example, the shopper assistance server **40** may set the redeemable value such that a higher shopper dwell time corresponds to a higher redeemable value.

At Block **92**, the shopper assistance server **40** communicates the digital promotion **29** to the mobile wireless communications device **30**, for example, for display on the user interface **37**. The shopper assistance server **40** may communicate the digital promotion **29** based upon detected shopper movement along the path of travel **21** after generating the digital promotion, for example. In an embodiment, the digital promotion **29** may be communicated upon generation thereof, but without displaying the redeemable value such that the redeemable value can be set by the shopper assistance server **40** without displaying the redeemable value to the shopper. Upon movement of the shopper, the shopper assistance server **40** may cooperate with the mobile wireless communications device **30** to display the redeemable value on the user interface **37**. Operations end at Block **94**.

Referring now to FIGS. **6-11** and the flowchart **160** in FIGS. **12***a* and **12***b*, beginning at Block **162**, operations of the shopper assistance server **40'** according to another embodiment will now be described, particularly with respect to the user interface **37'**. At Block **170**, the shopper assistance server **40'** determines whether the shopper dwell time **26'** exceeds a dwell time threshold, for example, indicative that the shopper is standing stationary in front of products for purchase **27'** along the path of travel. If at Block **170**, the shopper dwell time **26'** exceeds the dwell time threshold, the shopper assistance server **40'** cooperates with the mobile wireless communications device **30'** to provide the user interface **37'** for providing shopper assistance. More particularly, in the present embodiment, the shopper assistance server **40'**, via the user interface **37'** operates a chatbot **44'** to query the shopper as to whether they would like any help (Block **172**). The chatbot **44'** may prompt the shopper to select whether the shopper cannot locate products for purchase **45'**, the shopper would like nutritional information **46'** (e.g., supplemental nutrition assistance program) associated with one or more products for purchase, or the shopper would like a recipe **47'** associated with a product for purchase. The shopper assistance server **40'** may also cooperate with the mobile wireless communications device **30'** to (e.g., in the chatbot conversation), via the user interface **37'** prompt the shopper to select viewing or display of a digital sale circular **48'**, notify of out of stock or expired products **49'**, and/or order an item **39'** (e.g., an out of stock item). The retailer application **38'** may also include inputs **58***a*' **58***b*' corresponding to display of the digital sale circular and the shopper's account information, which may display clipped coupons, for example, saved to the shopper's account. The inputs **58***a*', **58***b*' may conceptually be considered always-on inputs, for example.

If the shopper selects or provides input corresponding to the chatbot **44'** requesting assistance locating a product for purchase **27'** (selection **45'**) (FIG. **8**), the chatbot **44'** may request input as to what product for purchase that shopper cannot find. The chatbot **44'** may display an image **51'** of the products for purchase with a visual indicator **52'** adjacent the requested product for purchase **27'** (Block **174**). In an embodiment, an augmented reality (AR) view of the display or shelf where the shopper is standing or dwelling may be displayed with an indicator highlighting where in the field of view the desired product for purchase **27'** is located.

If, at Block **172** the shopper selects, via the chatbot **44'**, nutritional information regarding a product for purchase **27'** (FIG. **9**) (selection **46'**), the chatbot **44'** may request input as to what product for purchase that shopper wishes to obtain nutritional information, for example, by providing written input via the chatbot conversation, and the shopper assistance server **40'** may provide the desired nutritional information **59'** via the chatbot (Block **176**). In an embodiment, the shopper may acquire and provide an image from a camera of the mobile wireless communications device **30'** within the chatbot **44'** of the product for purchase for which nutritional information is desired. In an embodiment, live camera view from a camera of the mobile wireless communications device **30'** may be displayed, and the shopper may provide touch input to the display on top of the desired product for which the nutritional information is sought.

If at Block **172**, the shopper selects, via the chatbot **44'** that the shopper would like a recipe corresponding to a given product for purchase **27'** (FIG. **10**) (selection **47'**), the chatbot **44'** may request input as to what product is included in a recipe and display one or more recipes **53'** corresponding to the desired product (Block **178**). The shopper assistance server **40'** may obtain the desired product for purchase **27'** for which a recipe is sought based upon an AR view or a live camera view, for example, as described above.

If the shopper, at Block **172**, selects viewing of a digital sale circular (selection **48'**), the shopper assistance server **40'** may display portions of the current digital sale circular **54'**

corresponding to one or more discounted or "on-sale" products adjacent the shopper (FIG. **11**) (Block **180**). The pages of the digital circular **54'** may be changed as the shopper moves along the path of travel. For example, bakery items featured in the digital sale circular **54'** may be displayed via the user interface **37'** when the shopper is in the bakery section of the physical store and when the shopper moves to the deli, deli items featured in the digital circular may be displayed.

Of course, some of the above-noted options, for example, display of the digital sale circular **48'**, may be user-selectable outside of the chatbot conversation such as, for example, within the user interface **37'** of the retailer application **38'**, specifically input **58***a*'. Moreover, as it relates to the digital sale circular **54'**, the ability to display the digital sale circular based upon the shopper location may be independent of the shopper dwell time (i.e., available for viewing regardless of whether the shopper dwell time exceeds a dwell time threshold). In an embodiment, the shopper may elect to display the digital sale circular **54'** in an "always on" configuration so that the digital sale circular is displayed within the user interface **37'** regardless of the inputs or other items displayed in the user interface. Other and/or additional features may be displayed within the user interface **37'**, for example, a notification or badge, and/or based upon location services.

If, for example, the predetermined shopper responses do not sufficiently address the shopper's query, the shopper may provide input, for example, by speaking or typing, to the chatbot conversation. The shopper assistance server **40'** may obtain the provided input, and through operation of the chatbot **44'** provide an appropriate response. As will be appreciated by those skilled in the art, the chatbot **44'** operates a two-way dialog with the shopper so that the shopper conversation mimics a conversation with another human being.

The shopper assistance server **40'** may operate the chatbot **44'** to learn common queries and responses for a given shopper position within the physical store **22'**. The shopper assistance server **40'** may also operate the chatbot **44'** to learn the query and response behaviors of other shoppers (e.g., as part of a large language model), for example, when those shoppers are located at the same or nearby shopper position within the physical store.

Operations not specifically described, such as obtaining the geographic position (Block **164**), determining the shopper dwell time (Block **166**), determining the product for purchase (Block **168**), and generating and communicating the digital promotion (Blocks **190** and **192**), are similar to those operations described above in Blocks **64**, **66**, **68**, **90**, and **92**, respectively. Operations end at Block **194**.

Referring now to FIGS. **13-14**, and the flowchart **260** in FIGS. **15***a* and **15***b*, operations of the shopper assistance server **40"** according to another embodiment will now be described with respect to learning shopper behavior. Beginning at Block **262**, the shopper assistance server **40"** stores historical shopper dwell times **26"** (Block **284**). The shopper dwell times **26"** may be stored along with corresponding dates, times, shopper identifiers (e.g., loyalty account identifiers). The shopper assistance server **40"** may store the historical shopper dwell times **26"** for actual dwell times or for certain dwell times, for example, exceeding a threshold. The shopper assistance server **40"** may store shopper dwell times **26"** as the shopper moves along the path of travel **21"** within the physical store **22'** '. The shopper assistance server **40"** may execute a large language model, for example, that studies and defines optimal location based product data. Loyalty shopper information may be applied to provide real-time geographic data across a store network, for example, to identify an optimal foot-traffic flow for use with purchase data, as will be appreciated by those skilled in the art. Product placement within a given store may be determined, for example.

At Block **286**, the shopper assistance server **40"** stores historical geographic position data **23"** associated with the shopper. More particularly, the shopper location within the physical store may be stored, for example, and correlated to the shopper dwell times **26"** so that the historical shopper dwell times are stored with the corresponding geographic position data.

The shopper assistance server **40"**, at Block **288**, predicts a shopper path of travel **56"** within the physical store **22"** based upon the stored historical shopper dwell times **26"** and historical geographic position data **23"**. The shopper assistance server **40"** operates a machine learning algorithm **57"** to predict the shopper path of travel **56"**. The machine learning algorithm **57"** may accept as input thereto the stored historical geographic position data **23"** and shopper dwell times **26"** (e.g., for the given shopper and/or other shoppers). The machine learning algorithm **57"** may also accept as input thereto product purchase history of the given shopper and/or other shoppers. The shopper assistance server **40"** may operate a prediction model on this data to generate the predicted shopper path of travel **56"**. The predicted shopper path of travel **56"** may be output from the machine learning algorithm **57"**. The shopper assistance server **40"** may generate the digital promotion **29"** based upon the predicted shopper path of travel **56'** '. More particularly, the shopper assistance server **40"**, may generate the digital promotion **29"** for a product for purchase **27"** that the shopper is predicted to pass and for which there is an associated dwell time. In an example, the given shopper may prefer a Brand-A product and typically has a relatively large shopper dwell time near the Brand-A products. The shopper assistance server **40"** may thus generate the digital promotion **29"** for a Brand-B product (e.g., competitor product), which is next to the Brand-A products on the shelf with the learned expectation that since the shopper spends time adjacent the Brand-A products, they may be more inclined to purchase a Brand-B product. The predicted path of travel **56"** may be used to determine placement of products, for example, along with non-dwell times.

Operations not specifically described, such as obtaining the geographic position (Block **264**), determining the shopper dwell time (Block **266**), determining the products for purchase **27"** (Block **268**), cooperating with the mobile wireless communications device **30"** to provide the user interface **37"** (e.g., via the retailer application **38"** (Block **272**), and generating and communicating the digital promotion **29"** (Blocks **290** and **292**), are similar to those operations described above in Blocks **64**, **66**, **68**, **72**, **90** and **92**, respectively. Operations end at Block **294**.

As will be appreciated by those skilled in the art, the shopper assistance system **20** may provide relatively valuable insights for retailers and manufacturers. More particularly, by using shopper dwell times **26** as a basis for operations, bottlenecks in physical store layouts, deficiencies in signage and product stocking, and deficiencies in the products (e.g., out of stock, expired, damaged) for purchase themselves may be identified. Alternatively, or additionally, higher shelf space values may be identified for products adjacent shopper having higher shopper dwell times, for example. Thus, promotions may be targeted with the possibility for a higher return or action upon the promotion.

A method aspect is directed to a method of assisting a shopper. The method includes using a shopper assistance server **40** to, as a shopper moves along a path of travel **21** within a physical store **22**, as the shopper moves along the path of travel within the physical store, cooperate with a mobile wireless communications device **30** associated with the shopper to obtain geographic position data **23** associated with a shopper position within the physical store, and determine a shopper dwell time **26** at a given shopper position within the physical store based upon the geographic position data. The method also includes using the shopper assistance server **40** to, as the shopper moves along the path of travel **21** within the physical store **22**, determine at least one product for purchase **27** adjacent the shopper based upon the given shopper position, and cooperate with the mobile wireless communications device **30** to provide a user interface **37** for providing shopper assistance with the at least one product for purchase based upon the given shopper dwell time **26**. The method further includes using the shopper assistance server **40** to, as the shopper moves along the path of travel **21** within the physical store **22**, generate and communicate to the mobile wireless communications device **30** a digital promotion **29** based upon the shopper dwell time **26**.

A computer readable medium aspect is directed to a non-transitory computer readable medium that includes computer executable instructions that when executed by a processor **41** cause the processor to perform operations. The operations include, as a shopper moves along a path of travel **21** within a physical store **22**, cooperating with a mobile wireless communications device **30** associated with the shopper to obtain geographic position data **23** associated with a shopper position within the physical store **22** and determining a shopper dwell time **26** at a given shopper position within the physical store based upon the geographic position data. The operations also include, as the shopper moves along the path of travel **21** within the physical store **22**, determining at least one product for purchase **27** adjacent the shopper based upon the given shopper position and cooperating with the mobile wireless communications device **30** to provide a user interface **37** for providing shopper assistance with the at least one product for purchase based upon the given shopper dwell time **26**. The operations further include, as the shopper moves along the path of travel **21** within the physical store **22**, generating and communicating to the mobile wireless communications device **30** a digital promotion **29** based upon the shopper dwell time.

While several embodiments have been described herein, it should be appreciated by those skilled in the art that any element or elements from one or more embodiments may be used with any other element or elements from any other embodiment or embodiments. Many modifications and other embodiments of the invention will come to the mind of one skilled in the art having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is understood that the invention is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the scope of the appended claims.

That which is claimed is:

1. A shopper assistance system comprising:

a mobile wireless communications device associated with a shopper and comprising first-range wireless communications circuitry and second-range wireless communications circuitry having a communications range less than the first-range wireless communications circuitry; and

a shopper assistance server configured to store a plurality of historical shopper dwell times,

store historical geographic position data associated with the shopper, and

as the shopper moves along a path of travel within a physical store,

cooperate with the mobile wireless communications device to obtain geographic position data associated with a shopper position within the physical store based upon the first-range wireless communications circuitry,

cooperate with the mobile wireless communications device to obtain the geographic position data associated with the shopper position within the physical store based upon the second-range wireless communications circuitry upon a degradation in communications via the first-range wireless communications circuitry,

determine a shopper dwell time at a given shopper position within the physical store based upon the geographic position data,

determine at least one product for purchase adjacent the shopper based upon the given shopper position,

cooperate with the mobile wireless communications device to provide a user interface for providing shopper assistance with the at least one product for purchase based upon the shopper dwell time,

predict a shopper path of travel based upon the plurality of historical shopper dwell times and historical geographic position data, and

generate and communicate to the mobile wireless communications device a digital promotion based upon the shopper dwell time and the predicted shopper path of travel.

2. The shopper assistance system of claim **1** wherein the shopper assistance server is configured to operate a chatbot via the user interface based upon the shopper dwell time.

3. The shopper assistance system of claim **2** wherein the shopper assistance server is configured to operate the chatbot to prompt the shopper to select one of whether the shopper cannot locate the at least one product for purchase, the shopper would like nutrition information associated with the at least one product for purchase, and the shopper would like a recipe associated with the at least one product for purchase.

4. The shopper assistance system of claim **1** wherein the shopper assistance server is configured to generate and communicate the digital promotion to the shopper based upon the shopper dwell time exceeding a threshold elapsed dwell time.

5. The shopper assistance system of claim **1** wherein the at least one product for purchase comprises a plurality of products for purchase; and wherein the shopper assistance server is configured to, via the user interface, display a portion of a digital sale circular corresponding to at least one discounted product for purchase from among the plurality of products for purchase adjacent the shopper.

6. The shopper assistance system of claim **1** further comprising a plurality of short-range wireless communications devices spaced about the physical store; wherein the second-range wireless communications circuitry comprises short-range wireless communications circuitry; and wherein the shopper assistance server is configured to obtain geo-

graphic position data based upon communication with the plurality of short-range wireless communications devices and the short-range wireless communications circuitry.

7. The shopper assistance system of claim **1** wherein the shopper assistance server is configured to operate a machine learning algorithm to predict the shopper path of travel.

8. The shopper assistance system of claim **1** wherein the shopper assistance server is configured to generate the digital promotion to be redeemable toward the at least one product for purchase adjacent the shopper.

9. The shopper assistance system of claim **8** wherein the digital promotion has a redeemable value associated therewith; and wherein the shopper assistance server is configured to set the redeemable value based upon the shopper dwell time.

10. The shopper assistance system of claim **1** wherein the shopper assistance server is configured to store historical product purchase data for the shopper and generate the digital promotion based upon the historical product purchase data.

11. The shopper assistance system of claim **1** wherein the first-range wireless communications circuitry comprises at least one of cellular wireless communications circuitry and global positioning system (GPS) wireless communications circuitry.

12. The shopper assistance system of claim **1** wherein the second-range wireless communications circuitry comprises at least one of Wi-Fi wireless communications circuitry and Bluetooth wireless communications circuitry.

13. A shopper assistance server comprising:

a processor and an associated memory configured to

store a plurality of historical shopper dwell times,

store historical geographic position data associated with a shopper, and

as the shopper moves along a path of travel within a physical store,

cooperate with a mobile wireless communications device associated with the shopper to obtain geographic position data associated with a shopper position within the physical store based upon first-range wireless communications circuitry of the mobile wireless communications device,

cooperate with the mobile wireless communications device to obtain the geographic position data associated with the shopper position within the physical store based upon second-range wireless communications circuitry of the mobile wireless communications device upon a degradation in communications via the first-range wireless communications circuitry, the second-range wireless communications circuitry having a communications range less than the first-range wireless communications circuitry,

determine a shopper dwell time at a given shopper position within the physical store based upon the geographic position data,

determine at least one product for purchase adjacent the shopper based upon the given shopper position,

cooperate with the mobile wireless communications device to provide a user interface for providing shopper assistance with the at least one product for purchase based upon the shopper dwell time,

predict a shopper path of travel based upon the plurality of historical shopper dwell times and historical geographic position data, and

generate and communicate to the mobile wireless communications device a digital promotion based upon the shopper dwell time and the predicted shopper path of travel.

14. The shopper assistance server of claim **13** wherein the processor is configured to operate a chatbot via the user interface based upon the shopper dwell time.

15. The shopper assistance server of claim **14** wherein the processor is configured to operate the chatbot to prompt the shopper to select one of whether the shopper cannot locate the at least one product for purchase, the shopper would like nutrition information associated with the at least one product for purchase, and the shopper would like a recipe associated with the at least one product for purchase.

16. The shopper assistance server of claim **13** wherein the processor is configured to generate and communicate the digital promotion to the shopper based upon the shopper dwell time exceeding a threshold elapsed dwell time.

17. The shopper assistance server of claim **13** wherein the at least one product for purchase comprises a plurality of products for purchase; and wherein the processor is configured to, via the user interface, display a portion of a digital sale circular corresponding to at least one discounted product for purchase from among the plurality of products for purchase adjacent the shopper.

18. The shopper assistance server of claim **13** wherein the second-range wireless communications circuitry comprises short-range wireless communications circuitry; and wherein the processor is configured to obtain geographic position data based upon communication with a plurality of short-range wireless communications devices spaced about the physical store and the short-range wireless communications circuitry.

19. The shopper assistance server of claim **13** wherein the first-range wireless communications circuitry comprises at least one of cellular wireless communications circuitry and global positioning system (GPS) wireless communications circuitry; and wherein the second-range wireless communications circuitry comprises at least one of Wi-Fi wireless communications circuitry and Bluetooth wireless communications circuitry.

20. A method of assisting a shopper comprising:

using a shopper assistance server to

store a plurality of historical shopper dwell times,

store historical geographic position data associated with a shopper, and

as the shopper moves along a path of travel within a physical store,

cooperate with a mobile wireless communications device associated with the shopper to obtain geographic position data associated with a shopper position within the physical store based upon first-range wireless communications circuitry of the mobile wireless communications device,

cooperate with the mobile wireless communications device to obtain the geographic position data associated with the shopper position within the physical store based upon second-range wireless communications circuitry of the mobile wireless communications device upon a degradation in communications via the first-range wireless communications circuitry, the second-range wireless communications circuitry having a communications range less than the first-range wireless communications circuitry,

determine a shopper dwell time at a given shopper position within the physical store based upon the geographic position data,

determine at least one product for purchase adjacent the shopper based upon the given shopper position,

cooperate with the mobile wireless communications device to provide a user interface for providing shopper assistance with the at least one product for purchase based upon the shopper dwell time,

predict a shopper path of travel based upon the plurality of historical shopper dwell times and historical geographic position data, and

generate and communicate to the mobile wireless communications device a digital promotion based upon the shopper dwell time and the predicted shopper path of travel.

21. The method of claim **20** wherein using the shopper assistance server comprises using the shopper assistance server to operate a chatbot via the user interface based upon the shopper dwell time.

22. The method of claim **20** wherein using the shopper assistance server comprises using the shopper assistance server to generate and communicate the digital promotion to the shopper based upon the shopper dwell time exceeding a threshold elapsed dwell time.

23. The method of claim **20** wherein the second-range wireless communications circuitry comprises short-range wireless communications circuitry; and wherein using the shopper assistance server comprises using the shopper assistance server to obtain geographic position data based upon communications with a plurality of short-range wireless communications devices spaced about the physical store and the short-range wireless communications circuitry.

24. The method of claim **20** wherein the first-range wireless communications circuitry comprises at least one of cellular wireless communications circuitry and global positioning system (GPS) wireless communications circuitry; and wherein the second-range wireless communications circuitry comprises at least one of Wi-Fi wireless communications circuitry and Bluetooth wireless communications circuitry.

25. A non-transitory computer readable medium comprising computer executable instructions that when executed by a processor cause the processor to perform operations comprising:

storing a plurality of historical shopper dwell times;

storing historical geographic position data associated with a shopper; and

as the shopper moves along a path of travel within a physical store

cooperating with a mobile wireless communications device associated with the shopper to obtain geographic position data associated with a shopper position within the physical store based upon first-range wireless communications circuitry of the mobile wireless communications device,

cooperating with the mobile wireless communications device to obtain the geographic position data associated with the shopper position within the physical store based upon second-range wireless communications circuitry of the mobile wireless communications device upon a degradation in communications via the first-range wireless communications circuitry, the second-range wireless communications circuitry having a communications range less than the first-range wireless communications circuitry,

determining a shopper dwell time at a given shopper position within the physical store based upon the geographic position data,

determining at least one product for purchase adjacent the shopper based upon the given shopper position;

cooperating with the mobile wireless communications device to provide a user interface for providing shopper assistance with the at least one product for purchase based upon the shopper dwell time,

predicting a shopper path of travel based upon the plurality of historical shopper dwell times and historical geographic position data, and

generating and communicating to the mobile wireless communications device a digital promotion based upon the shopper dwell time and the predicted shopper path of travel.

26. The non-transitory computer readable medium of claim **25** wherein the operations comprise using the shopper assistance server to operate a chatbot via the user interface based upon the shopper dwell time.

27. The non-transitory computer readable medium of claim **25** wherein the operations comprise generating and communicating the digital promotion to the shopper based upon the shopper dwell time exceeding a threshold elapsed dwell time.

28. The non-transitory computer readable medium of claim **25** wherein the second-range wireless communications circuitry comprises short-range wireless communications circuitry; and wherein the operations comprise obtaining geographic position data based upon communications with a plurality of short-range wireless communications devices spaced about the physical store and the short-range wireless communications circuitry.

29. The non-transitory computer readable medium of claim **25** wherein the first-range wireless communications circuitry comprises at least one of cellular wireless communications circuitry and global positioning system (GPS) wireless communications circuitry; and wherein the second-range wireless communications circuitry comprises at least one of Wi-Fi wireless communications circuitry and Bluetooth wireless communications circuitry.

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